Volume 36 Issue 17 • August 22, 2014

PROCESSOR®

Products, News & Information Data Centers Can Trust. Since 1979

(800) 247-4880
www.Processor.com

More Outlets In A Smaller Space, Now In 60-Amp

Server Technology High Density Outlet Technology Solves Typical Space, Configuration Issues

Until recently, combining a large number of outlets into a small form factor while still allowing for a vast range of outlet configurations and the ability to power racks full of equipment simply wasn't possible for most data centers.

Server Technology changed all that with the introduction of its High Density Outlet Technology (HDOT), which utilizes a unique style of C13 and C19 outlets that removes excess material in the housing to allow for the maximum possible outlet density in a PDU. Initially launched with three 30-amp base models, the HDOT lineup is expanding with a 60-amp version and new features.

Common Voltages & Phases

The new 60-amp, three-phase Delta 208V product fills out the Server Technology Smart family of PDUs and the four most common voltage, phase, and current categories, says Travis Irons, director of engineering at Server Technology.

The 30-amp versions include a single-phase product in either 208V or 230V; a three-phase Delta 208V 30-amp model; and a three-phase Wye 400V or 415V product available with 30 or 32 amps.

With the new 60-amp product, Irons says Server Technology took HDOT a step further and arranged the outlets in an alternating phase configuration, which alternates the power phases on a per-outlet, rather than per-branch, basis. This simplifies phase balancing and cable management. The company is also releasing an alternating phase 400V or 415V. Both of the new HDOT products are featured on Server Technology's Build Your Own PDU Web site.

Exactly What It's Designed For

Initial customer response to HDOT has been great. "The biggest thing people like is the density," Irons says. "That's exactly what it was designed to do—provide lots of outlets and lots of different combinations to make everyone happy."

HDOT has literally thousands of possible outlet configurations, Irons says, so customers can tailor the product to put the outlets they need closest to equipment. "That shortens cable runs, improves airflow, and simplifies cable management," he says.

With the 60-amp product, for example, there are two outlet modules, with 18 or 21 outlets depending on the mix of C13 and C19 outlets you need. You can have up to 42 C13 outlets, 18 C19 and 18 C13 outlets, or more than a dozen other combinations.

HDOT also helps you consolidate PDUs. Most data centers today have two or three rack configurations with different outlet requirements, Irons says. "With HDOT, because of the large number of outlets, they're often able to provision for both of those racks with a single PDU."

Color & Other Options

As with other Server Technology PDUs, the HDOT PDUs come with color options: black, blue, green, red, white, and a new yellow version. The system includes a color label on the PDU, a colored band on the PDU cord, and an ancillary dot you can put on other equipment associated with the PDU.

HDOT features the highest possible native retention plug holding force, and Irons says most customers don't need a secondary device for retention. "But we do have additional methods of retention if needed." P

Server Technology
Quality Rack Power Solutions

Contact

(800) 835-1515
www.servertech.com

Contact Us:

P.O. Box 82545
Lincoln, NE 68501-2545
or
120 W. Harvest Drive
Lincoln, NE 68521

Advertising: (800) 247-4880
(402) 479-2141
Fax: (402) 479-2104

Circulation: (800) 334-7458
Fax: (402) 479-2123
www.Processor.com
email: feedback@Processor.com

PROCESSOR®

© Copyright 2014 by Sandhills Publishing Company. All rights reserved. Reproduction of material appearing in *Processor* is strictly prohibited without express prior written consent. *Processor* is a registered trademark of Sandhills Publishing Company.

SIGN UP
TO RECEIVE THE DIGITAL EDITION . . .

IT'S FREE

SUPERMICRO®

FatTwin™

16% Net Power Savings with Supermicro FatTwin™ Solutions

vmworld

VMworld 2014 August 24 - 28th, 2014
San Francisco, CA
Moscone Center - South Hall
Come visit our booth @ 2217

- **Best Efficiency** - 16% Less Power Used than Major Competitor
- **Best Density** - 8 Hot-swap 3.5" HDDs per 1U Space
  - 12 Double-Width Xeon Phi™ Cards in 4U
- **Best Performance** - 135W highest-end CPU Supported
- Supports Intel® Xeon® Processor E5-2600 and E5-2600 v2 product families

FatTwin Advantage

FatTwin delivers maximum performance, efficiency and versatility for scientific, research, engineering, and enterprise organizations requiring high-performance, scalable computing and storage solutions for mission-critical applications. The platform is optimized for process intensive database driven applications including Big Data and Hadoop analytics, gas and oil exploration, HPC, computational finance, search engines, design and modeling, simulation and many other applications.

SYS-F647G2-FT+ Series
4U, 2 Nodes
Front I/O
New!

SYS-F617R2-F Series
4U, 8 Nodes
Front I/O

SYS-F617R3-F Series
4U, 8 Nodes
Front I/O

SYS-F627R2-F Series
4U, 4 Nodes
Front I/O

SYS-F617R2-R Series
4U, 8 Nodes
Rear I/O

SYS-F627R3-R Series
4U, 4 Nodes
Rear I/O

SYS-F627G2-F Series
4U, 4 Nodes
Front I/O

SYS-F627R3-F Series
4U, 4 Nodes
Front I/O

SYS-F627G3-F Series
4U, 4 Nodes
Front I/O

Flexible Designs Optimized for a variety of Applications, including:

- Data Center / Cloud / Hadoop applications
- HPC / GPU applications
- Science / Research environments
- Finance / Oil & Gas markets

intel inside™ XEON®

Digital! We Power the Cloud

SUPERMICRO X9 SERVER PLATFORMS

www.supermicro.com/FatTwin

© Super Micro Computer, Inc. Specifications subject to change without notice.
Intel, the Intel logo, Xeon, and Xeon Inside are trademarks or registered trademarks of Intel Corporation in the U.S. and/or other countries.
All other brands and names are the property of their respective owners.

SMCI-20140616-A

BREAK FREE
FROM YOUR OLD PBX
WITH 3CX PHONE SYSTEM

REDUCE YOUR COSTS
INCREASE PRODUCTIVITY
DELIVER MOBILITY
WITH A SOFTWARE PBX

10 Advantages of 3CX Phone System

1. Easy to manage by an IT administrator
2. Costs less to buy and expand
3. Greater return on investment
4. Use existing hardware and make huge savings
5. More features by leveraging Windows technologies
6. Hardware & vendor independent – no vendor lock in
7. Better fault tolerance through easy backup of your PBX
8. 3CX Phone System is more scalable than hardware PBXs
9. Better integration with other business applications
10. Easily build voice applications that increase productivity

3CX®
Software PBX for Windows

VISIT 3CX
WWW.3CX.COM

Scan to download

www.3cx.com

+1 (404) 465-3660

info@3cx.com

The optimal cooling solution

COMPU-AIRE INC.

System 2100

DX Floor Mount Systems

6 to 60 (21KW- 211KW) Ton Capacities

High Efficiency Options Available:

■ EC Fan Technology ■ Air/Water Side Economizer ■ Variable Frequency Drives ■ Multiple Unit Network ■ Under Floor Static Pressure Control ■ Direct-evap Media

www.compu-aire.com
(562) 945-8971

AMERICOOL
PORTABLE A/C

CREATE & MAINTAIN AN ENVIRONMENT THAT MEETS ALL YOUR MISSION CRITICAL NEEDS

WMC-2500
MODULAR COOLING W/ 4 INSTALLATIONS*
- RACK-MOUNTED
- HUNG FROM CEILING
- PORTABLE W/ CASTERS
- STACKED 1-ON-1

*OPTIONAL ACCESSORY KITS

ALL UNITS, COLD AIR NOZZLES CAN BE REPLACED W/ INCLUDED GRILLS

NEW HEAT PUMP
18,500 BTU/H HEATING
16,800 BTU/H COOLING

NEW
7.5 TON
COOLING UNIT

800.680.0725 | AMERICOOLINC.COM

SCAN TO VIEW OUR ENTIRE FAMILY OF PORTABLE A/C UNITS

BayTech

37 Years Made in the USA

www.baytech.net

Control and Circuit Metering-MRP

Unique Features

All Circuit Breakers Monitored

Most metered power solutions only monitor input power. BayTech monitors all circuit breakers and reports via SNMP when thresholds are met.

Optional Outlet Metering with Efficiency

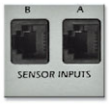
Monitor individual outlets and receive current, watts, and volt-amps. Continuously monitoring equipment for efficiency with power factor.

High Retention C13 Receptacle

Reliable integrated locking clips assure power cord retention. Unique to the industry and does away with nuisance wire clips.

Reliable PCB Power Distribution

ISD's (Insulation Displacement) connectors are faulty and unreliable! All BayTech power solutions use reliable PCB power distribution.



Integrated Sensor Inputs

Eliminate the need for extra environmental monitoring devices. All BayTech power solutions offer two ports for external temperature and humidity probes.

Build Custom Power Solutions with Standard Modular Product

BayTech's MRP Modular Rack Power system provides reliable power distribution with maximum flexibility for receptacle selectionand power input.

BayTech offers three classes of the MRP system. Switched and monitored, simply monitored and individual receptacle monitoring.

User friendly interface for controlling power to receptacles, monitoring Current, Voltage, Watts, Temperature, Humidity, and KW Hour Meter.

Standard Features

- High and Low Density Models
- 120/208/AC Single Phase
- 208/400VAC Three Phase
- 20,30,50,60 Amp Support
- On/Off Reboot Control
- HTTPS, SSH, SSL Access
- Radius, TACACS Authentication
- Tool less Mounting

Unique Features

- Modular Design
- All Circuit Breakers Monitored
- KW Hour Meter
- Current, Voltage and Watt Meters
- Integrated Locking C13 Receptacle (Optional)
- Reliable PCB Power Distribution

Bay Technical Assoc. Inc. 5239 A Avenue Long Beach, MS 39560 Tel: 228-563-7334 Fax: 228-563-7335 sales@baytech.net

iStarUSA® Group

Premier IPC OEM/ODM Manufacturer

www.istarusa.com

THE AUDIO/VIDEO SERIES

iStarUSA's Renaissance Chassis Just Expanded

iStarUSA | Industrial Trayless Chassis

80 PLUS

High Efficiency 80 Plus Power Supplies

XEAL Power Supply

EAGE SERIES

External JBOD Tower

RAIDAGE Data Storage

WS SERIES

Best Lineup in the Game

CLAYTEK Cabinet & Racks

New Products

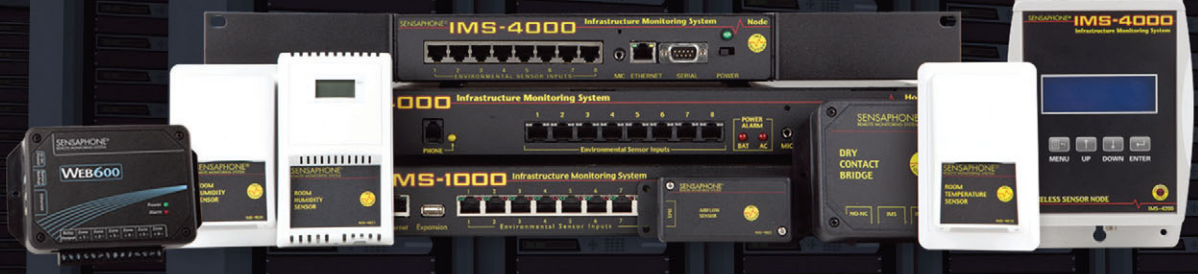
Mobile Drive Cage

The Trayless

Accessories

727 Phillips Drive, City of Industry, CA 91748 Tel: 1-888-989-1189 Fax: 1-626-301-0588 www.istarusa.com

ASSURANCE



Countless data centers depend on Sensaphone for the most comprehensive temperature and environmental monitoring systems available. When you need to be absolutely sure your data center is stable, secure and monitored around the clock, there's no substitute for certainty.

Call today for your FREE application guide and catalog

SENSAPHONE®
REMOTE MONITORING SOLUTIONS

For more information visit
www.sensaphone.com

or call toll free
877-373-2700

MADE IN USA

Fike's PROINERT²... the Safest, Most Economical Fire Protection Solution

- Naturally better for the environment, resulting in ZERO global warming potential.
- Cost-effective, flexible design options for easy installation & maintenance.
- Essential fire protection without damage caused by water-based systems.

PROINERT®²

Protecting people, assets and the environment.

Fike®

Visit the new **FIKE.COM**

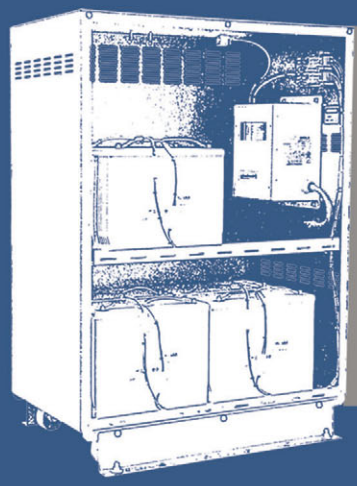
1-866-758-6004

are you a data center looking for a new way to

reduce downtime

and cut costs in the process?

www.ccpower.com/spares



on site spares battery cabinets

are a critical aspect of efficient data center operations.

why?

find out

www.ccpower.com/spares

why are we so confident in our products? we built them.

630.617.9022
sales@ccpower.com
www.ccpower.com

C&C POWER
ENGINEERED POWER PRODUCTS

hergo® 888.222.7270 CALL TODAY! hergo.com

Open Racks and Enclosure Cabinets

Offering also:

- Command Centers
- Data Centers
- IT Furniture
- Workstations
- Tech Workbenches
- Mobile Carts
- Enclosure Cabinets
- Relay Racks

Hergo - An original equipment manufacturer - is an approved supplier to all branches of the U.S. Government.

GSA Contract GS-29F-0133G

hergo® YOUR trusted Technical Workspace Solutions since 1992

56-01 55th Ave., Maspeth, NY 11378 | Tel: 888.222.7270 | Fax: 888.410.0671

Terms, specifications & appearance are subject to change without prior notice • © 2014 hergo

Protect Your Facility...

Don't Wait Until It's Too Late!™

Room *Alert*®

- MONITOR
- ALERT
- LOG
- GRAPH
- VIEW
- REPORT
- MANAGE
- PROTECT

AVTECH Software, Inc. • Sales **888.220.6700** • Store **EnvironmentMonitor.com** • Web **AVTECH.com**

FIRSTTECH™

We Specialize
In Cleaning
Data Centers

Made In America

EZ-Lifter II - $169

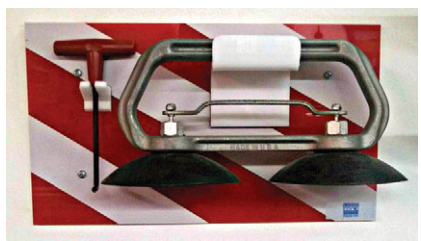
Re-engineered from the ground up, the EZ-lifter II is like no other access floor lifter tool. Made with a solid one piece frame construction, the EZ-Lifter II has unsurpassed strength and durability. Anyone who's ever had to use a regular floor-lifter will appreciate the convenience of E Z-lifter II. Simply drop the tool with its 5-inch dual suction cups on the appropriate tile, tilt towards you, and pull. It's just that easy.

Comprehensive Cleaning

FirstTech's under-floor cleaning is the solution to eliminating all of the dust and contaminants that can wreak havoc in your work environment. Cleaning diminishes the risks of fouled circuitry, accidental fire, random Halon discharges, hazardous contaminants, and various health problems. In the end, you will have a HEPA cleaned environment. Visit www.firsttechcorp.com to learn more about all of our cleaning solutions.

Floor Pullers

A floor puller is a must-have in any data room with a raised access floor. This combo set includes a durable perforated tile puller and dual 5-inch suction cup tile puller. The bright red makes these tools easy to find and the bracket keeps them accessible.



$17.95 (Perforated Tile Puller Only) / $36.95 (Tile Puller Only)
$62.95 (Tile Puller with Bracket) / $80.45 (3 Piece Combo Shown)

Protective Covers

Custom fit protective covers are designed to protect power sources, EPOs, and a variety of other needs. Made from durable acrylic and designed with hinges to open and close. Call for pricing.

FirstTech Corporation — Two Industrial Drive, Keyport, NJ 07735 — (800) 743-6001 — www.firsttechcorp.com

spot coolers
Portable Air Conditioning and Heating

COOL SOLUTIONS

With cooling from 1-12 tons and the ability to customize units to whatever size you need, Spot Coolers brings you instant, cost-effective, cool relief! We're available every day, all day, 365 days a year!

PORTABLE COOLING
RENTALS & SALES

800.367.8675
www.spot-coolers.com

MOVINCOOL.
PREFERRED DISTRIBUTOR

MovinCool, SpotCool and Office Pro are registered trademarks of DENSO Corporation.

DRAMATICALLY CUT DATA CENTER COSTS & ACHIEVE A PUE OF 1.05... IN ONE COOL MOVE

THE CRITICAL DIFFERENCE.

The new Liebert® DSE™ precision cooling system features the industry's first pumped-refrigerant economizer, making it 70% more efficient than conventional cooling systems. Along with the advanced monitoring and auto economizer mode-switching of Liebert iCOM™ controls, the Liebert DSE uses innovative variable load matching with digital scroll compressors, EC fans, and electronic expansion valves to allow the system to operate at the highest efficiency in both partial and peak conditions.

Most importantly, the components of the system work together for the industry's most efficient cooling system without the hassles or maintenance of traditional economizer systems.

Liebert EconoPhase First ever pumped refrigerant economizer

Thermal System Manager with Liebert iCOM™

Liebert MC™ Intelligent, high efficiency condensers

Liebert Proprietary Data Center Management Intelligence and Optimized Aisle

Liebert DSE Indoor Unit

Next generation data center cooling system

DATA CENTER SYSTEMS, INC.
Providing Solutions to Critical Problems

EMERSON
Network Power

Datacsi.com 952.843.1481

A Revolution in Data Center Containment Doors!

Pro-Glide* by Simplex

- No protruding header or track assembly.
- Sweep seal and perimeter gasket provides maximum containment.
- Operates smoothly. Self-aligning doors require no adjustment.
- Pre-hung. Installs in minutes.
- Available in single doors up to 48" wide, double doors to 72" wide.

*U.S. patents pending

Protecting Critical Environments for Over 35 Years

SIMPLEX™ ISOLATION SYSTEMS

Call us today!
1.800.854.7951
www.simplexisolationsystems.com

LINDY® CONNECTION PERFECTION

(888)-865-4639
www.lindy-usa.com

USB Port Blocker

System administrators can physically prevent users from connecting Pen Drives, MP3 Players and other USB Mass Storage Devices to their computers to copy data, introduce viruses, etc. The USB Port Blocker is a combined 'key' and 'lock' assembly which plugs into the USB port. Simply plug the 'keylock' into the port and release the latch - the lock remains in place! Plug the key back into the lock to remove. Easy!

- Physically blocks access to a USB port
- Consists of 4 locks and 1 key
- 5 different color code versions available: Pink, Green, Blue, Orange, White

USB 2.0 Slimline Active Extension Cable

- Compatible with both USB 2.0 and USB 1.1 devices
- Connectors:
  Type A USB Male to Type A USB Female

FireWire Active Extension Cable

- FireWire Repeater Cable for extending the cable length between FireWire devices over distances greater than the IEEE 1394 specified limit of 4.5m

Wireless VGA Compact Projector Server

- Ideal for use with PowerPoint and other presentation applications
- Connects to the VGA port on your projector

InfraSolution® S Smartcard Access Control for Cabinet

Upgrade your cabinet with smartcard access control less than $ 350 per cabinet

MiFARE SMARTCARD

PROXIMITY SMARTCARD

>>> Key Highlights

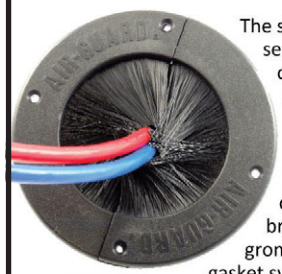
- Easy & quick installation
- Designed for IT branded cabinet
- Universal mounting cut out
- MiFARE & Proximity compatible
- Unique coded keys available
- Free & user friendly management software
- Fit for left, middle or right door opening
- Audio & visual alarm while unauthorized access

Options : Door sensors for audio alarm while unauthorized access
Double security by master & user cards

InfraSolution S series smartcard handle is designed for standalone cabinet.
To look for network and remote control solution,
please send your inquiry to : inquiry@austin-hughes.com
www.austin-hughes.com
1-510-794-2888

AUSTIN® HUGHES Austin Hughes Solutions Inc.
8668 Thornton Ave,
Newark, CA 94560

5" ROUND FLOOR GROMMET



Top view

The superior choice for sealing cable cutouts in data center raised floors.

Utilizing a heavy duty double layer brushed grommet rubber gasket system, the Air-Guard 5" Round, incorporates a secondary flexible EPDM synthetic "rubber" gasket material to deliver airtight seals around cables.

Bottom view

Eliminate air leakage and control airflow bypass, install the new Air-Guard 5" Round floor grommet in raised floor cable cutouts.

The two piece ABS polycarbonate construction is UL94 VO rated, meets NFPA 75 standards, and is easy to install

PDU Cables™
866.631.4238 pducables.com

Call for a free quote or visit our Online Store at: www.pducables.com

COMPUTERWISE.

Ethernet Wall Clock

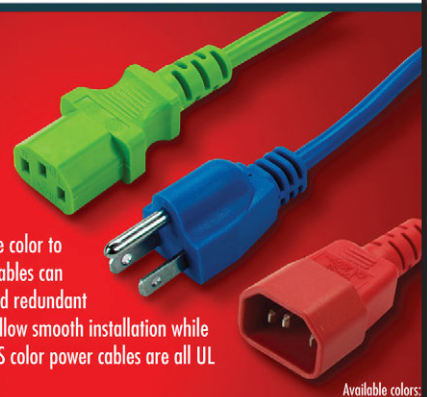
The ED310 is a high visibility (4" high digits) time of day Ethernet wall clock. The ED310's Ethernet connection allows its internal time-of-day value to be periodically synchronized with a local computer's NTP clock across your LAN. The time can be displayed in either military format or in AM/PM format. Up to four alarm schedules can be defined to trigger either the internal bell or any one of four optional relays.

ED310 Features

- Four Inch Tall Digital Display
- Four seven segment red digits
- Remotely Controlled Timer Mode
- Web Browser Control Interface
- Auto SNTP Synchronizing
- 10/100BaseT Data Rates
- Optional six digit model
- Optional Dual/Quad Relay Outputs
- Optional PoE Power Sourcing
- Optional Wi-Fi Wireless Access

ComputerWise • 1.800.255.3739 • sales@computerwise.com

TOTAL CABLE SOLUTIONS



Let Total Cable Solutions bring some color to your data center. TCS color power cables can help differentiate between main and redundant power. These ultra-flexible cables allow smooth installation while saving significant cabinet space. TCS color power cables are all UL certified and RoHS compliant.

Available colors:

COLOR POWER CABLES by Total Cable Solutions

Feature

ALSO AVAILABLE

SURE FIT™ LOCKING SLEEVE

Create a strong connection and prevent power cables from being accidentally dislodged. SureFIT™ is compatible with most standard power cables.

www.TotalCableSolutions.com

SecureSleeves

Locking IEC Cables

Color Coded Cables

Pre-Terminated Solutions

Standard and Custom Cable Solutions

- **SecureSleeves** making the connection stronger by securing plugs with SecureSleeves. Providing a tighter fit on IEC cables can prevent inadvertent disconnects.
- **Locking IEC Cables** protect equipment that is vulnerable to vibration. The connector cannot be accidentally pulled or vibrated out of the inlet.
- **Colored Cables** can help distinguish various cord functions in a high density installation; playing a critical role in quick connection identification.
- **Pre-terminated Networking Solutions** can be installed quickly providing high performance and reliability; ideal solutions for mission critical data centers, temporary networks, central offices, and disaster recovery.

Connect today at 1.800.870.2248 or email ePDU@hmcragg.com

HM CRAGG
Quality People. Quality Power.

Need Portable Cooling?

Call the Specialists

Call 800.972.6600

Primary, supplemental or emergency cooling for data centers, server & telecom rooms

• Portable and ceiling-mount models • Offices nationwide • On call 24/7

Atlas Sales & Rentals, Inc.
THE PORTABLE COOLING & HEATING SPECIALISTS

www.AtlasSales.com

MOVINCOOL® PREFERRED DISTRIBUTOR

MovinCool, SpotCool & Office Pro are registered trademarks of DENSO Corp.

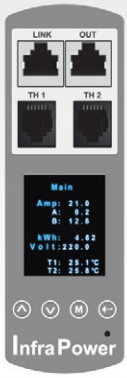
InfraPower® PDU Inspired by Your Data Center

Intelligent kWh PDU

Key Highlights

- kWh and Amp monitoring
- Switched & Monitored models
- Outlet-level measurement
- Daisy chain ports up to 16 levels
- Patented IP Dongle for IP Cost Saving
- SNMP traps and email alerts
- GUI management software
- Field replaceable meter with 1.8" LCD
- Tool less Mounting
- Temp-humid sensor port x2
- Circuit breaker monitoring
- Customization on request
- NEMA 110V / IEC 208V

Option : Surge Protection
EMI Filter



AUSTIN HUGHES®
Austin Hughes Solutions Inc.
8668 Thornton Ave,
Newark, CA 94560

inquiry@austin-hughes.com
www.austin-hughes.com
1-510-794-2888

PROCESSOR®
(800) 334-7458

THE INSTANT ACCESS YOU NEED.

www.PROCESSOR.com

NOW *PROCESSOR* CAN GO

ANYWHERE

YOUR iPAD GOES!

You asked for it, and *Processor* listened. Now you can read the latest issue of *Processor* from cover to cover, exactly as it appears in print, for free on your iPad!

PROCESSOR.COM

Gartner's Emerging Technologies Hype Cycle Zeros In On Digital Business

Celebrating 20 years of predictive analytics, this year's Hype Cycle for emerging technologies from Gartner explores the maturity, adoption, and market applicability of digital business. There are six business era models in the digital business development path—analog, Web, e-business, digital marketing, digital business, and autonomous—and Gartner takes a deep dive into the latter three phases to prepare enterprises for evolving technologies, as outlined below.

DIGITAL MARKETING. In addition to anticipating the Nexus Of Forces (mobile, social, cloud, and information), enterprises should prepare for increasingly sophisticated ways of interacting with customers and managing brand influence.

TECHNOLOGIES TO WATCH: Software-defined anything; volumetric and holographic displays; data science; prescriptive analytics; complex event processing; big data; content analytics; hybrid cloud computing; NFC; virtual reality; gesture control.

DIGITAL BUSINESS. Gartner says this stage will be characterized by the concept of blurring physical and virtual worlds. Expect commerce (digital currency) and interpersonal (health monitoring) transformations to take place as people, business, and things experience a new level of convergence.

TECHNOLOGIES TO WATCH: Bioacoustic sensing; digital security; smart workspace; affective computing; speech-to-speech translation; the Internet of Things; cryptocurrencies; wearable user interfaces; 3D printing; machine-to-machine communication services; mobile health monitoring.

AUTONOMOUS. This is what Gartner describes as the post-nexus stage, which is defined by an "enterprise's ability to leverage technologies that provide humanlike or human-replacing capabilities."

TECHNOLOGIES TO WATCH: Virtual personal assistants; human augmentation; brain-computer interface; quantum computing; smart robots; biochips; smart advisors; autonomous vehicles; natural-language question answering.

Mobile Devices Are A Daily Part Of Healthcare Professional Routines

Results of a recent EPG Health Media study of qualified healthcare professionals show that 82% of medical physicians use a mobile phone and 62% use a tablet at least once per day for work-related purposes. Personal computers and laptops are used for professional reasons by 99% of healthcare professionals around the world; however, according to Kantar Health, mobile devices have recently experienced an uptick in usage with 79% of United States physicians using smartphones for healthcare tasks and 51% using tablets for the same purpose. Below is a general breakdown of how healthcare professionals worldwide are using devices in their respective workplaces:

	PERSONAL COMPUTER/LAPTOP	MOBILE PHONE	TABLET
5+ Hours	29%	6%	5%
3 - 4 Hours	15%	4%	5%
2 - 3 Hours	16%	8%	5%
1 - 2 Hours	20%	17%	18%
30 Mins. - 1 Hour	13%	22%	14%
< 30 Mins	5%	24%	15%

4G Connection Rate Growing Rapidly

It's full steam ahead for 4G Long Term Evolution (LTE), with network infrastructure construction and availability "at an all-time high," according to Juniper Research. The research firm expects the number of 4G LTE connections worldwide to surpass the 1 billion mark in 2017 and to reach 1.8 billion connections by 2018, which would amount to 22% of all mobile device cellular network connections. Juniper expects almost one-third of all smartphones shipped this year will be 4G LTE-ready and says a type of 4G called Time Division LTE (TD-LTE) will be huge in China and other emerging markets. ""TD-LTE will play a significant role, especially in the emerging markets, pushed by China Mobile's need to support TD-LTE and accelerate its commercial deployment in China. There are 36 commercial TD-LTE networks, and we expect active TD-LTE connections to demonstrate a higher annual growth rate when compared to FD-LTE (Frequency Division) over the next five years", notes report author Nitin Bhas.

Mobile Banking Available & Used Often

Mobile banking technologies are now available throughout the world, thanks largely to demand in developed regions, says Juniper Research. In a recent report, the research firm points out that 800 million mobile phone users will have used their device for mobile banking by the end of this year. Furthermore, Juniper forecasts that more than 1.75 billion will use mobile banking by the end of 2019. Related to this data, Juniper says, is "the decreasing

number of branch visits by consumers and the closure of physical bank branches" over the past two years. The report indicates emerging markets are also seeing marked growth in mobile banking.

Gartner Expects PC Market To Experience "Revival"

This year "will be marked by a relative revival of the global PC market," says Ranjit Atwal, research director with Gartner. That doesn't mean increased sales, however, but rather a softer decline. Although overall computing devices (including desktop and mobile computers as well as mobile phones) will grow 4.2% this year compared to 2013, according to Gartner, the PC share will contract by 2.9%; but that's compared to a 9.5% contraction in 2013. Gartner attributes the improvement to business replacements and upgrades from the no-longer-supported Windows XP.

Tablet Growth Expected To Resume

ABI Research anticipates that when the totals are in for the second half of this year, we'll see that tablet shipments will have grown after a gloomy first quarter. The research firm expects total manufacturer shipments of tablets to reach 200 million units by year's end, worth about $85 billion. "We have yet to reach the top of the tablet market," says Jeff Orr, senior practice director with ABI Research, "and with many world regions just now starting to adopt, the best is yet to come." Orr points out that Intel alone expects 40 million devices using its processors will ship this year.

Smartphones' Worldwide Hold

It's impossible to walk down a city street these days and fail to observe that smartphones have captivated the attention of the masses. New research from eMarketer shows that by year's end, 1.76 billion people (a little less than one fourth of the world's population) will own and use smartphones. The market research firm expects the tally to grow to one third of the world's population by 2017. It forecasts that 50% of 15 countries' population will use smartphones by 2015 (those include Canada, much of Europe, and South Korea); the United States and U.K. are among a handful of nations that have already crossed the 50% mark.

New Uses Bolster GPS Device Market

The GPS tracking device market will top $3.5 billion in 2019 if a recent ABI Research forecast becomes reality. Patrick Connolly, senior analyst with ABI Research, points to GPS-enabled wearables and Internet of Things technologies as up-and-coming market drivers. In the past, the research firm says, price barriers, indoor location limitations, and other issues hampered the GPS tracking device market, but things are changing. "Over the last 12 months," Connolly says, "there has been a host of companies entering this space." Some, he adds, "are moving into areas such as mobile workforce management and lone worker applications, while the connected home market will evolve to support personal protection across children, pets, cars," among other areas. ABI Research reports that there has been a "significant increase" in shipments of GPS integrated chips during the past year. These chips include GPS among other functions and are often ideal for small devices such as wearables.

The Tech Small Businesses Rely On

Results from an Ipsos Public Affairs poll of 551 owners of United States businesses with 500 or fewer employees, published in May, show that mobility is important for small to midsized businesses (SMBs), with just 19% of respondents saying that they and their employees don't work away from their desks. The study indicates a high level of technological self-reliance among SMBs, as well, with 66% reporting that they handle their own tech support issues; 12% hire an outside vendor to handle such problems. Additionally, 68% say laptop computers are important for business (67% say desktops are important), whereas 60% say smartphones are important for their business. Furthermore, 66% rely mostly on laptops for computing and 62% rely mostly on desktops for computing. In terms of storage usage, the poll indicated that 36% store business content mainly on hard drives (26% stick mainly with file cabinets) and 30% use cloud computing technologies (60% do not; 9% don't know what cloud computing is).

Why Government Tech Projects Fail

Analysts with research firm Gartner examined the circumstances surrounding technological failures in projects undertaken by the governments of the United States, Great Britain, and Canada, and determined three things the failures had in common. According to Gartner's press release on the matter, the top reason was that the agency's ambitions were too large and complex relative to available resources. Portfolio management was another problem, with business leaders taking control of complex IT decisions they might not fully understand. The inability to identify responsibility and manage risks are the third commonality.

What You Need To Know About Tin Whiskers

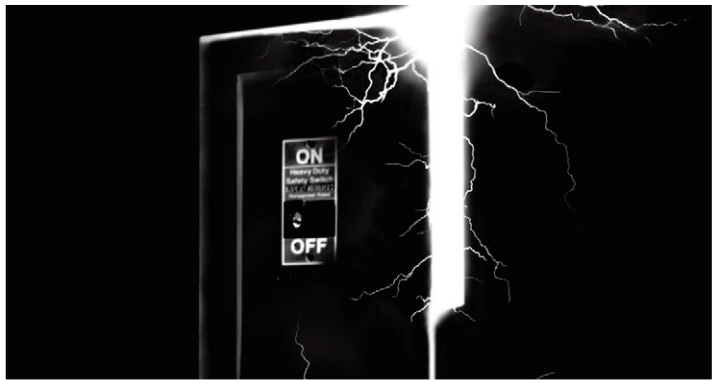
Although The Current Risk May Not Be Great, You Should Still Be Able To Spot Signs Of Trouble

Imagine a tiny filament thinner than a human hair. Something that can grow off of tin-plated surfaces. A potential nuisance that could grow long enough to short-circuit or certainly degrade the operation of electrical circuits. Put those things together and you have how Henning Leidecker, an engineer at NASA's Goddard Space Flight Center, describes tin whiskers.

What They Are

Not to be confused with zinc whiskers, tin whiskers form when there are compressive stresses in tin plating on component leads, says Ronald C. Lasky, Ph.D., P.E., instructional professor at Dartmouth College and senior technologist at Indium Corp. If you have residual compressive stresses over time, say weeks to months, you can see tin whiskers form, he says.

"It's one of those things that, even if you know a lot of materials science, it still seems strange," Lasky says. "Say I take a funnel with a really small exit diameter on the bottom, and I put some peanut butter in. If you just put the peanut butter in, nothing is going to happen, because it's pretty thick. But if you press on it, it would come out the bottom." That, Lasky says, is one way to explain tin whiskers—if you increase the compressive stress, you get more whiskers.



What's Being Done

Although such whiskers are known to have caused problems since the early days of World War II, Leidecker says, in some ways they've come to the forefront again since the European Union's adoption of the Restriction of Hazardous Substances (RoHS). As a result of RoHS, Leidecker says, more manufacturers started using pure tin, which is more prone to growing whiskers than tin mixed with lead, which is less prone to whisker growth.

Lasky says most component manufacturers are taking steps to mitigate the possibility of tin whiskers. One step is using a satin-bright finish on the tin, he says, noting that bright tin platings are more susceptible to tin whisker growth.

The most common under material in a component lead is generally copper, Lasky says, which "preferentially diffuses into tin and can cause stresses." Because of this, many manufacturers are placing a flash of nickel between the copper and tin. "That just about eliminates the diffusion of the copper into the tin," Lasky says.

Manufacturers are also coating some electronics with an organic or inorganic coating such as parylene. Lasky says this technique doesn't necessarily prevent tin whiskers, and some whiskers can poke through the coating.

These mitigation techniques work to make it "statistically less and less likely" tin whiskers will create problems with circuits. "Manufacturers are doing things like using satin-bright finish, putting nickel plating between copper and tin. Another thing is putting 2 to 4% bismuth in the tin," Lasky says. "Each of these things has been shown to reduce tin whiskers

Is The Problem Widespread?

In his experience managing data centers, Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says he never had an equipment failure that could be attributed to tin whiskers. "That doesn't mean it didn't cause it, but since the act of equipment failing often results in damage to the equipment around the parts that were impacted by the whiskers, performing some form of forensic analysis of the failure was unlikely to uncover that the cause was tin whiskers. When components failed, it isn't often known why."

Henning Leidecker, an engineer at NASA's Goddard Space Flight Center, says from what he's studied and seen, most impacted electrical equipment has used coatings of tin, zinc, or cadmium. Problems include intermittent shorts caused by a whisker that grows across two conductors, permanent shorts where the whisker is wedged into place and is able to carry the shorted current, and metal vapor arcs that create considerable destruction.

significantly. If you combine them all together, you get a situation where I believe the tin whisker risk is less than other risks."

How Much Of A Risk?

Part of the mystery behind tin whiskers is that it's difficult to point to them as an ultimate cause for component failure. "Many operations are completely free of whisker-induced problems," Leidecker says. "And many operations that are having whisker-induced problems are not correctly assigning the cause. There are usually multiple sorts of problems encountered when running a computer center, and when whisker-induced problems happen to be only a small fraction of the total, then they may be forever overlooked."

However, Leidecker says, if a data center experiences a "perfect storm" of issues, including lots of metal whiskers being generated and arriving at critical circuits with no protection (such as conformal coating) for those circuits and circuits whose design allows damage by metal-whisker shorting, a data center could have an outage. "We have direct experience with centers having 20 to 75% of their computers being shut down by shorts induced by metal whiskers."

What You Should Do

In addition to being aware of tin whiskers, Lasky says those in charge of buying and researching the equipment used in enterprise data centers can take some reasonable precautions and make sure your component and equipment suppliers have a tin whisker risk mitigation strategy.

"Say to the supplier, "Hey, I hear about these tin whisker things, what are you doing to reduce risks?," Lasky says. A salesperson may not know what tin whiskers are. "But they'll go back to their technical people. Most technical people have talked with their suppliers to make sure they have some mitigation strategy in use in the components they're supplying."

If you find out your equipment supplier either doesn't have a tin whisker mitigation strategy or can't find out if its component suppliers have one, "then I would be concerned," Lasky says. "It's not something a reasonable component manufacturer is just going to blow off." P

Keep A Clean Data Center

"There is little you can do from a facilities standpoint to address whiskers being created inside the electrical components as a result of tin plating of parts and soldering," says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com). "But keeping the data center clean will help to prevent contaminants from entering computer equipment and potentially dislodging tin whiskers and causing electrical shorts in the equipment."

At this time, he says, there simply isn't enough understanding of what causes whiskers to allow a data center to change or control the environment to limit the development of the whiskers.

BONUS TIPS:

Spot The Signs

As a data center and IT professional, you should know and be able to spot the potential signs of tin whisker issues. "Get training into how to recognize attacks by whiskers, either tin or zinc," says Henning Leidecker, an engineer at NASA's Goddard Space Flight Center. "We have seen some sad stories in which failures were being observed and only recognized to being caused by metal whiskers after a long time and great expense trying other solutions. Quick recognition is the better road." Based on cases Leidecker has seen, items to watch for include unexplained shutdowns, UPSes with internal short circuits, and, in a more unique case, puddles of copper on the bottom of a cabinet.

Put It In Perspective

Although you don't want to downplay the issue of tin whiskers, Ronald C. Lasky, Ph.D., P.E., instructional professor at Dartmouth College and senior technologist at Indium Corp., offers some perspective. "If you did a failure modes and effects analysis for tin whiskers, solder joint failure because of temperature cycling, and maybe disk drives, it's probably going to be more likely that you'd get a disk drive or joint thermal failure before you get a tin whisker fail," he says. "I don't want to minimize it, I don't want to say it can't happen, it's just that if you're working with a supplier that's taking reasonable precautions such as using satin tin, you may have some tin whiskers, but the level of risk is going to be less than you would have with a mechanical disk drive fail."

Boost Your Security Awareness Training

Focus On Quality & Regularity To Help Your Workforce Retain Security Policy

As the current state of security programs in the enterprise stands, more than 55% of personnel haven't received security awareness training from their organizations, according to Enterprise Management Associates' recent report "Security Awareness Training: It's Not Just For Compliance."

This lack of training can result in some significant consequences, which means even though employees generally receive training on an annual basis, a high frequency of training is more desirable to help increase knowledge retention.

Training Is Useless Without Employee Cooperation

You can invest in the latest feature-laden security software solutions and roll out every layer of protection possible, but these defenses may not protect your company from a negligent or uninformed user who makes a wrong decision using enterprise-deployed devices or software.

"IT and corporate security teams spend money on technical solutions like firewalls and advanced anti-malware products that help with security issues, and on process-based improvements like penetration tests, auditing, and secure application development," says Adrian Sanabria, senior security analyst at 451 Research. "Even after millions are spent on corporate security, the average user engaged in unsafe behavior on a company computer can still cause significant damage."

Faisal Ghaus, vice president of TechNavio Research, agrees, saying that enterprises invest a substantial amount in security for their assets, but "the technology they invest in, however, is only as good as the individuals who use it."

He adds that the lack of security awareness creates a gap between the employees and the organization's security policy, potentially resulting in individual users causing an unintentional security or data breach unbeknownst to them.

Provide A Training Experience, Not A Test

According to industry experts, the primary problems with many existing training programs include not working with a qualified trainer, not starting with the basics, over-genericizing training courses, and not providing enough programs to offer support for growing workforces.

Randy Abrams, research director at NSS Labs, says the first step is to train the trainer. "Part and parcel to this is selecting a competent translator. Technically savvy people are often great at training other techies; however, training a non-technical user requires a trainer who can translate geek speak to human talk," Abrams says.

Sanabria says one of the most important steps in security awareness training is to prioritize what training you're using and who you're training.

"Force employees to go through too much training or boring training, and they won't have a chance of remembering it all. Use overly generic training, and it might not be relevant to their job roles. Use training that's too old, and it might not be

Key Points

- Any security technology you invest in is only effective if employees use it intelligently, so ensure awareness training is practical and engaging.
- Aim to provide relevant security training on a regular basis so workers can apply the latest preventive strategies.
- Follow through with security policies you've implemented but don't become impersonal.

Get Started

Although it might be tempting to roll out a one-and-done training program, Adrian Sanabria, senior security analyst at 451 Research, says if possible, select a product that allows for continuous training and integrates into your work environment. "There are products that can identify users making risky choices as they are doing it and can educate them on the spot. Choose a product that is constantly updating its product based on changing guidance from experts and industry trends."

relevant, or worse, could train your employees to make the wrong choices."

Sanabria says security awareness training should be up-to-date, customized, and engaging. He adds that it's typically easier and less expensive to custom-design an internal training program than throw more money at the issue.

TechNavio's Ghaus says it's critical that numerous training programs be "implemented and refreshed on a much more regular frequency than what is being done today." Therefore, keep in mind that an IT manager may not be best suited to enforce security policies, he says, but rather the IT manager would be more directly responsible for educating the workforce about data breach consequences and safeguarding practices.

Implement Policy & Work Together With Employees

Policy and training are inextricably linked, because "a lack of training decimates policy," Abrams says. "If a user does not understand the implications of their actions, they are unable to comply with policy despite their best intentions."

Basic training starts by assuming the user knows nothing, he says. Employees won't understand how to use strong passwords unless they are taught what one is in detail.

"Failing to provide training on how to create a long, memorable password . . . will result in password reuse or weak passwords," Abrams says. "Despite arguments against the use of password managers, a password manager with a very strong password virtually always mitigates risk much better than almost all other approaches."

Even more practically, Sanabria says to make training personal and highlight positive examples and successes. He advises creating a "feedback loop" to capture these examples, such as an email account employees can send messages to.

"For example, when an employee raises an alarm about something suspicious, even if it turns out to be nothing malicious, thank them for it. Reward them with praise. Don't use Web-based surveys—users tend to tell you what they think you want to hear, not what they really think," he says. So, alternatively, try interviewing them informally to gain realistic feedback.

Ghaus says it's always in the best interest of the company to ensure that its personnel are on the same page when it comes to security and "this message needs to be refreshed, as is the case with any company-related policy." P

Action Plan

Determine who needs training. The last thing you want to do is assume who is already in the know and who is in the dark. Find out what your departments require before moving forward.

Formulate an education strategy. Avoid using common training tactics, if possible, and instead make security training an interactive and interesting learning experience for workers.

Ensure that training is consistent. Retention dwindles when companies fail to train on a regular basis, so it's wise to create a schedule that's manageable for training managers and individual employees alike.

Top Tips

Train creatively. Adrian Sanabria, senior security analyst at 451 Research, says trainers need to utilize a relevant or natural way to learn in order to help employees retain security awareness. "Mix it up and use social engineering services. Create cheat sheets people can hang in their cubicles. Hang posters and send newsletters." Or, you can even offer in-person or online classes.

Focus on training frequency. Faisal Ghaus, vice president of TechNavio Research, says organizations must continually focus on how often it trains individuals. "No matter how rich or useful the content of the training is, without regular and periodic training sessions, the seriousness and the impact of data breaches will never be imbibed in the individuals."

Go beyond compliance. Reduced security awareness retention may be the result of training that's completed to simply "satisfy regulatory requirements," says Sanabria. If you see this complacency happening, consider outsourcing to a professional training company.

Use Discovery Tools To Cut Hardware & Software Costs

Theft, Shadow IT, BYOD & Other Activities All Play A Role In How & Why You Track Assets

Many enterprises still discover their hardware/software assets manually before logging them in a spreadsheet—a time-consuming method that can lead to overlooking hardware theft, shadow IT, BYOD, and other activities and missing out on cost savings, optimization, compliance, and auditing opportunities tied to licensing, software usage, and unused hardware.

Cost is commonly cited as a reason small to midsized enterprises (SMEs) don't use discovery tools for such chores, despite some experts who suggest free and affordable options are available. Some enterprises even have (but may not use) discovery tools embedded in solutions they already possess.

Set Out To Discover

Although a spreadsheet can help compile an inventory list for annual review requirements, odds are the IT team is only including the basics (hardware model, serial number, primary software, etc.) and doesn't track changes over time. A discovery tool can collect BIOS, memory, CPU, OS, software version, patches, and other information in a fraction of the time; note changes in a change log; and automatically update inventory.

The value of discovery tools is "getting the most up-to-date data with minimal effort," says Sandi Conrad, Info-Tech Research Group senior consulting analyst. For example, beyond knowing there are exactly 300 computers vs. "about 275," discovery tools can help you know 25 systems are missing from the network or 275 have a $300 software package installed but only 150 are using it.

Conrad says the biggest savings for organizations that manage their software are in licensing only what's being used. Another benefit is reducing maintenance and support costs. Many discovery tools also produce reports about hardware or an application's ability to, say, handle a new OS. Some tools have automated abilities to generate regular audits that, when combined with contract/licensing management, offer insight into compliance and responding to audits and software agreement renewals, Conrad says.

Clive Longbottom, founder and service director at Quocirca, says Quocirca research shows IT managers on average are certain of hardware they have in place within only a +/-20% level. In maintenance discussions with vendors, managers feel they need to err on the conservative side and are likely overpaying for maintenance because they lack adequate discovery and tagging tools, Longbottom says.

In an asset world where spreadsheets rule, he says, shadow IT equipment can go unlogged, equipment may be disposed of but not deleted from the system, or the occasional equipment can disappear because of advertent or inadvertent theft. IT teams have even less of an idea about software in their enterprises, he says.

The Tools

Discovery tools suitable for SMEs are fairly abundant. Pricing for higher-end, enterprise-level tools can be an issue, but freeware offerings can provide effective asset and service

Key Points

- Numerous discovery tools are available, including some as free options.
- Using a discovery tool can help reduce software licenses for packages installed but not being used.
- Discovery tools are becoming more valuable as shadow IT and similar activities increase and cause compliance and other issues.

Get Started

Less expensive, less sophisticated discovery tools can provide most of what the average small to midsized enterprise needs and are relatively straightforward to install and configure but still include vendor support, says Sandi Conrad, senior consulting analyst at Info-Tech Research Group. Before buying a tool, identify the OSes, databases, and application types you need the tool to discover and manage and ensure it can fulfill compliance, budgeting, and support needs, she says. Conrad also suggests organizations check with their helpdesk vendor, as it may offer much of what's needed at a reasonable price.

management. Some free tools have good community support for using the tools, Longbottom says. Conrad says many discovery tools integrate with service desk and configuration management database (CMDB) systems.

Dennis Drogseth, vice president of research at Enterprise Management Associates, says tools with automation functionality are of great OPEX value to smaller IT staffs, as one person can do much more with a good tool vs. manually. Some discovery tools do have a singular focus, such as being geared to software licenses, he says, which can lead to saving money and gaining insight about what's installed but may not completely help manage assets through their life cycle or provide the needed configuration insights.

Patricia Adams, Gartner research director, says among vendors' tools, core features tend to be fairly similar. Most tools are agent-based and possess software usage abilities, she says. Higher-end tools may also include relationship maps showing how entities are connected. Such abilities are a good match for businesses seeking better change-impact analysis or fast incident identification and problem resolution, she says. Higher-end discovery tools are also adding new levels of analytics, such as indicating if an application deployment falls within compliance of a vendor's rules.

How To Deploy

The way you deploy discovery tools depends in part on the problem you're trying to resolve. Drogseth says although much depends on the environment, endpoint management and optimization are consistent focus areas. Feature-wise, he advises looking at tools that can help understand license and software usage, manage change, automate configuration, and perform update/patch management to the endpoint level.

For organizations adding more mobile devices, Adams advises an agent-based tool to scan those devices. If obtaining a standalone tool, ensure it fits the given environment.

"Some standalone tools, for example, don't discover iOS," Adams says. "They only discover Windows." Some client management systems do have mobile device management abilities that support iOS devices, she says. P

Action Plan

Quocirca Founder and Service Director Clive Longbottom lists the following capabilities as ones small to midsized enterprises should seek in discovery tools:

Hardware. Seek discovery abilities to a granular level, including for data center servers and storage and anything attached or attaching to the network. A tool should identify the server model, disk drive, network interface card, motherboard, CPU, OS, and other information.

Software. Discovery should identify a suite version and also the package type (student, enterprise, etc.) and patch level.

Management. Seek a tool that can adequately manage software license contracts. Higher-end systems may be able to identify licensing deals and use real data to offer advice on deals.

Maintenance. Seek a tool that can maintain maintenance details and preferably determine an asset's book value and provide schematics for assets for physical and logical levels.

Automation. Look for the ability to identify if a system goes offline (via failure or removal) and provide full reporting.

Top Tips

Prepare for change. Investing in discovery tools can mean also investing in new ways of working, which may require communication, planning, and process changes.

Start low. Consider initially using a discovery tool to grab the "low-hanging fruit," such as using a tool to discover what devices are on the network and what software is on those devices.

Look beyond discovery. Some discovery tools provide loads of raw data that's challenging to navigate. Focus on what you'll do with the data, such as using the tool and data to send alerts or provide audit trails when changes occur.

Make The Most Of Enterprise Virtualization

Where To Begin & Where To Go Next

Virtualization has been around for quite some time, which means that most companies, big or small, have probably embraced the technology to some degree. However, taking advantage of virtualization involves much more than consolidating a few servers and improving server efficiency. It helps to build a solid foundation, but from there, you have to think outside the box to receive all the benefits virtualization has to offer.

Application Profiling & Consolidation Ratios

Dave Bartoletti, principal analyst at Forrester Research, says the first step is to take inventory of your applications to see "what resources they're actually using —not what you're giving them, but what they're actually using."

Bartoletti says that the best candidates for virtualization are often the ones that aren't using all of the allocated resources and simply aren't as efficient as they should be. Take for instance an application running on a physical server with a lot of memory and disk resources allocated to it. That application may "only be using 5% of the CPU on average and is using very little memory."

Bearing this in mind, companies need to constantly monitor their consolidation ratios, Bartoletti says, and know how well every virtualized host is using the available resources.

"Make consolidation ratios and performance management regular parts of your IT operations process," he says. "On a weekly basis, you should be able to write a report to say, 'we have consolidation ratios of about five virtual machines per server and our servers are utilized to this percentage.' You're always looking for places where you might not have done a good job with consolidation the first time and have opportunities to consolidate more."

Life Beyond Consolidation

A common misconception about virtualization is that it's synonymous with consolidation. And although consolidation is a major benefit, it isn't the only one.

Greg Schulz, senior advisory analyst with Server and StorageIO, says physical server consolidation is often the "low-hanging fruit" when it comes to virtualization and that some companies have already virtualized as much as possible, but are still looking for more ways to improve.

For those companies that want to move beyond the base benefits of virtualization, Schulz recommends looking at things such as application agility, resource flexibility, and even disaster recovery and business continuity.

"If I've already done some server consolidation, I could maybe use virtualization to set up a second site that's active or on standby mode, but I can use virtualization to move things over more dynamically than I can now," says Schulz. "Or, I have that ability where I can go in and virtualize a server, system, or application so that it becomes

Key Points

- Pick the right apps for virtualization and make sure you are constantly evaluating your consolidation ratios.
- Think about use cases outside of consolidation and don't rule out mission-critical apps and systems.
- Use virtualization to improve efficiency throughout the company as well as for proof-of-concept projects.

Get Started

Once you decide which applications you want to virtualize, you should "establish a test bed so you can do some proof of concepts, prototyping, and figure out how your tools will work in that environment," says Greg Schulz, senior advisory analyst with Server and StorageIO. He adds that whether you're a small company with a few employees or a large organization with hundreds or thousands, it's crucial to make sure that an application will make the transition to a virtualized environment without negatively impacting performance or efficiency. "It's all about gaining experience," Schulz says.

more portable and I can pick it up and move it, whether it's for upgrades, maintenance, failing over, business continuity, disaster recovery, and things like that. It starts to open up new doors."

Optimization & Proof-Of-Concept Testing

Another way to differentiate the advantages of virtualization and consolidation is to look at the network and storage optimization tools that are available in many of the modern hypervisors used today.

"For example, you might have virtualized servers and they're all in a shared storage environment," says Bartoletti. "You might decide that for better performance, you want to use the memory that's on the VM or local storage on the server itself."

Bartoletti adds that there are a lot of tangential benefits to server virtualization. "Most modern hypervisors let you use local disk, not just remote or shared storage, to increase the performance of VMs running on a particular server," he says.

Schulz says that virtualization can also be used to develop proof-of-concept projects that may not even be tied to virtualization. For instance, in his environment when he plans to test a new piece of software and needs a separate operating system and environment, he'll "spin up a new virtual machine, download all of the software, and try it out, rather than go and buy another server."

This is a great way to test out a new application or system without jeopardizing the rest of your infrastructure, ensuring it will run as expected when you deploy it.

Consider Mission-Critical Applications

Bartoletti says that some companies decided against virtualizing certain applications in the past because they thought it was too risky, but he explains that what was once considered risky is "probably much safer today."

For that reason, Bartoletti recommends that companies "look at those applications that are more business-critical, performance-sensitive, and performance-hungry," because "there aren't that many core business applications that you can't run in a virtual machine."

And if you're worried you don't have the skill or expertise necessary to take on these tasks, you should work with your vendors and ask them for reference customers that are also virtualizing those business-critical apps, he says. They should be able to give you a starting point and help make sure your implementation is as seamless as possible. P

Action Plan

Choose your applications. Decide which applications would benefit most from virtualization. Don't only focus on low-performance applications, but also consider which mission-critical systems might thrive in a virtualized environment.

Build a test environment. Create a test bed where you can load up virtualized applications and test them in a real-world environment. Put them through their paces and make sure you don't negatively impact performance.

Start small. When you actually deploy a virtualized application, start with something small before ramping up to larger systems. It's important to constantly test and refine along the way so you don't damage the user experience.

Top Tips

Virtualization makes cloud migration easier. Dave Bartoletti, principal analyst at Forrester Research, says that all public cloud infrastructure is virtualized and those services "are well-designed for applications that are already virtualized." If your company plans to embrace the cloud in the future, you should virtualize your applications now. "It's much easier to move a virtualized application into a cloud and run it there than it is if it's still running on a physical server in your environment," he says.

Improve resource flexibility. Greg Schulz, senior advisory analyst with Server and StorageIO, says virtualization can go beyond consolidation to improve the utilization of your equipment. "If I find out that a high-performance application is only busy from 8 a.m. to 5 p.m., why don't I put virtualization on the server, push all of the other VMs off during the daytime, and then at night start moving reporting, analytics, maintenance functions, and other VMs that may be set on a slower machine during the day," he says.

Combine Your Data & Storage Networks

Convergence Introduces New Challenges But Also Offers Benefits If Implemented Correctly

Technologies such as Fibre Channel over Ethernet are bringing the idea of network convergence to the forefront. This type of implementation makes it possible to combine your storage area network (SAN) and local area network (LAN), for instance, and run both of them over the same network and networking equipment. However, even though this idea has been around for quite some time, companies are still hesitant to dive in and actually converge their networks.

We'll tell you about some challenges associated with network convergence as well as the potential benefits you might see with a proper implementation.

Potential Benefits Of SAN/LAN Convergence

The primary benefit of converging your data and storage networks is that you would only have one network to manage rather than two separate ones. And if you take advantage of technologies such as Fibre Channel over Ethernet, you can also save money on cabling and other equipment.

For example, Jonathan Jew, co-chair of the data center subcommittee and president of J&M Consultants, says that you will save on overall networking equipment costs because "switches and server interfaces that handle LAN traffic can also handle SAN traffic." This could also make setting up and upgrading easier because converged networks would use Ethernet cabling and LAN protocols, which "network engineers and technicians are more familiar with," Jew says.

"SAN equipment, cabling, and configuration are often planned and executed by staff whose primary responsibility are servers or storage," says Jew. "LANs are typically planned and installed by people whose primary responsibility are networks and they typically do a better job of planning and installing networks. SANs are just another network. Fibre Channel SANs use relatively expensive optical fiber cabling and interfaces."

Brad Casemore, research director at IDC, agrees that companies can save money using converged networks, adding that you can "reduce the number of I/O adapters, cables, and switches, because you don't have the redundancy of two networks." He adds that cable vendors are now working on 25G and 50G cables to "fill gaps in the market," which should make convergence easier.

Major Challenges & Barriers To Adoption

If implemented correctly, a converged network will make it so that networking professionals can focus on setting up and managing the network, while storage professionals can focus on storage-oriented tasks rather than worrying about setting up a completely separate SAN.

Casemore says it's this change in how data center managers view their data and storage networks that is a major sticking point and barrier for adoption in some companies. However, he is confident that enterprises will eventually adopt converged networks.

Key Points

- It's possible to achieve cost savings in multiple areas with convergence, but only if you implement it properly.
- Many storage professionals don't feel comfortable with convergence yet, but that should change in the future.
- Keep up with the newest networking technologies and know what equipment you need to support convergence.

Get Started

Before you consider converging your data and storage networks, make sure you think about your other infrastructure as well. For example, Brad Casemore, research director at IDC, says that when you adopt software-defined storage, flash, or the cloud, "you begin to think differently about your network." These new methods of storage "really drive the need for new approaches in networking," he says. In other words, you need to find a purpose and a reason for taking advantage of network convergence, because then you'll work toward a specific use case and increase your chances of a successful implementation.

"In the enterprise space, Fibre Channel has persisted," he says. "It's going to take a long time because people have storage arrays for up to a decade and they usually keep the storage networking technology that they use with them. The storage market is a very slow churn and I think that's part of what contributed to fibre's longevity in the market. Even now, we see it declining slightly, but it's certainly not declining precipitously."

Casemore says, however, that as the market continues to shift toward Ethernet and away from fibre as well as toward software-defined networking (SDN) and software-defined storage (SDS) and away from traditional networking and storage, enterprises will eventually jump on board.

"They all operate from a similar precept where you're trying to pool resources, use industry-standard infrastructure, and put the control and management in a software layer that runs above the pool of hardware resources," he says. And as companies realize that Ethernet is the best way to achieve these types of networks, SAN and LAN convergence may become more common.

Ensuring A Proper Implementation

IT managers have to understand that network convergence will require a shift in mindset and that changes will need to be made to accommodate it in the future. "SANs require low-latency, high-bandwidth networks," says Jew. "I anticipate that server connections will need to be at least 10G and switch-to-switch backbone connections will need to be at least 100G to support converged networks."

Jew adds that "multimode optical fibre will be the most cost-effective way to implement 100G [Ethernet] backbone links if the connections are within the distance limitations specified by IEEE." But there is expected to be a new four-lane implementation called 100GBASE-SR4 in 2015 that companies should look out for, because it "will support distances of up to 70 meters over four pairs of OM3 multimode optical fiber and 100 meters over four pairs of OM4 multimode optical fiber," he says. P

Action Plan

Research. It may seem obvious, but because network convergence is a relatively new concept for many organizations, you need to understand what all goes into the process and how it will change the way your networks operate.

Look at your infrastructure. Make sure that network convergence is a fit for your specific environment. There could be some situations where combining your SAN and LAN might introduce unnecessary bottelenecks, so you need to determine how to solve that problem ahead of time.

Get help. Many networking vendors offer case studies on their websites that show how companies have successfully implemented network convergence. Use those as a template to test out your own potential implementation.

Keep evolving. Networking technology is constantly changing, so make sure you keep up with the newest trends to ensure the best possible network performance.

Top Tips

It will take time. Jonathan Jew, co-chair of the BICSI data center subcommittee and president of J&M Consultants, says he is familiar with companies that are "planning or beginning trials of SAN/LAN convergence, but none of them are deploying widely into production yet." But he adds that "like the eventual elimination of separate voice networks in the corporate world, I expect that SAN/LAN convergence is only a matter of time." He recommends that companies interested in testing out the technology use resources provided by the TIA and ANSI to determine the best ways to set up converged networks.

Consider management roles. Brad Casemore, research director at IDC, says that the idea of network convergence is directly related to who manages the storage network. He warns that if the storage team runs the storage network, "there's a great chance you'll have a dedicated storage network," which will make it an even larger technological, operational, and cultural shift in the future. If you're planning a network upgrade sometime soon or are setting up an entirely new network, make sure your management roles and future intentions are clear from the beginning.

Take A Look At Disaster Recovery As A Service

Almost Any Enterprise Can Benefit From Better Backup & Recovery, But Is DRaaS The Answer?

Disaster recovery may not be your area of expertise—and that's all fine and understandable. But you know that changing technology and demands from both customers and business leaders mean you need rock-solid backups and a way to quickly and reliably recover them if (and when) needed.

Enter the disaster recovery as a service (DRaaS) model, which lets an enterprise turn over its disaster recovery to a third party, says David G. Hill, principal at Mesabi Group. The cloud can either be a managed private one, where a service provider offers specific services for each client individually, or a public cloud, where resources are shared in a multitenancy model, Hill says.

But the question remains, "Does disaster recovery as a service have a role in my data center and, if so, to what extent?"

Why The Need?

The concept of DRaaS has been around for years, says Joe Clabby, president of Clabby Analytics. But cloud service providers are just getting into it.

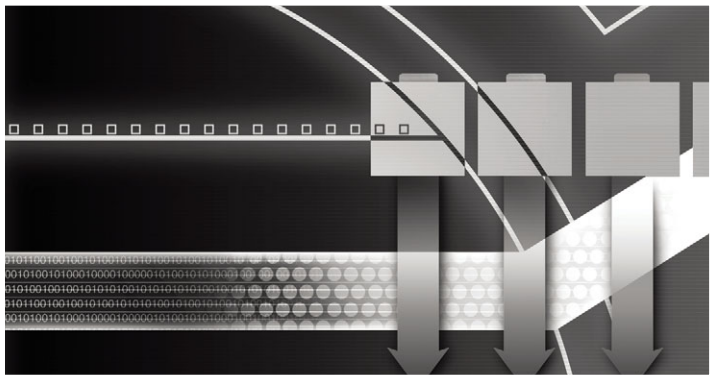
The need is fairly clear. "A lot of companies do disaster recovery poorly. They formulate a disaster recovery strategy and they implement rudimentary disaster recovery services. But how often do they test these systems? Are they kept up-to-date? Who manages disaster recovery (who owns it)? If you outsource this function, the answers to these questions become a lot more clear," Clabby says.

There are several aspects to DRaaS, says Greg Schulz, senior advisory analyst at Server and Storage IO, but it comes back to protecting your business and leveraging a service to do that.

Get Started

Although you may have room to improve your enterprise's backup and disaster recovery, disaster recovery as a service (DRaaS) may not necessarily be the way for you to do it.

"Step back and have a clear understanding of your needs and wants. What do you absolutely have to have vs. like to have?," says Greg Schulz, senior advisory analyst at Server and Storage IO. "Look on an individual application basis, RTO, RPO, what do you need, what do you want, what are you willing to pay for?" Once you have that understanding, look at different options and shop smartly, he says. The cloud could offer an affordable second or third site to store your data.



"How are you going to do that and what are you going to do? Are you just going to outsource it all to some service? Move a complete copy to that service? Or are you going to do everything yourself—keep it onsite and use some new tools and technologies? Or will it be hybrid, where you leverage a service but have some stuff onsite?"

Schulz sees big opportunity in a hybrid model. As part of disaster recovery, he says, if you're doing backups, you could be backing up to remote disk or remote storage. Instead of doing a copy, you could do replication or snapshot; instead of going to a system at another site, you could actually be replicating to another service that happens to be at another location, he says.

Issues To Consider

Hill says the benefits of DRaaS include improved cost effectiveness over traditional methods, better functionality through automated disaster recovery testing, and easier business planning as contracts are more flexible and short-term and the payment model may be pay-as-you-go.

But there are numerous issues to consider. Functionality, costs, security, and compliance are among the most important, Hill says. Potential costs need to include much more than just the initial investment. You need to know your variable and fixed costs and switching costs, including both the out-of-pocket

Key Points

- Disaster recovery as a service (DRaaS) offers a way for enterprises to hand off disaster recovery to a third-party service provider via the cloud.
- Concerns about functionality issues, costs, security, and compliance issues are among the potential drawbacks.
- If you choose DRaaS, find a provider that's a true partner, not just an order taker.

expense and the learning curves for employees.

Don't forget regulatory and compliance issues, whether they're government, industry, or self-imposed, Schulz says. For example, Clabby says, some countries are particular about what data is moved where and won't let data be held outside of the mother country.

Hill says that all companies can benefit from DRaaS. A key to disaster recovery is that the site be at an acceptable distance—at a minimum of 60 to 100 miles, but better is 300 miles or more, he says. For small to midsized enterprises, putting their backup in the cloud through backup as a service (BaaS) gets their data safely stored at required distances, he says.

Midmarket companies, Hill says, might not be able to afford the costs to set up and maintain a remote data center for disaster recovery purposes. "A smaller upfront investment and a variable cost (such as based upon how much data is protected and how it is protected) make it more manageable."

Larger companies have a large sunk investment that may be a mix of their own disaster recovery data center capabilities and taking advantage of the offering of outsourcing specialists. "They may have to move more cautiously. Can they save money while at the same time improving resiliency and recovery time and gaining additional functionality such as automated DR testing?"

Choose A Partner

Finding a reliable DRaaS provider isn't easy. A true partner, Hill says, will tell you that what you plan to do is not right (and offer a solution) or what it has to offer is not going to meet your needs. "An order taker wants to sell what it offers whether it is right for you or not," he says.

"It really comes down to being a relationship model. You are betting your company (and your job) on the ability of the service provider to do what it promises," Hill says. "How comfortable are you working with the service provider? How likely is it that the service provider will remain financially viable and continue to develop its service offerings?" P

Action Plan

Decide whether disaster recovery as a service is a fit. "If you have the expertise and the budget, you can do it yourself. If you don't have the expertise, I suggest farming it out to someone who does," says Joe Clabby, president of Clabby Analytics.

Go in with eyes wide open. Greg Schulz, senior advisory analyst at Server and Storage IO, says you need a good idea of your concerns such as cost, compliance, and security, because then you can work them out. Also learn from the mistakes of others by seeing what went wrong. "All providers have had outages, so why were some customers impacted and others weren't? Some are going in with a low-cost mentality vs. reliability."

Share responsibility. Only you can prevent cloud data loss, Schulz says. "You can't blame the service provider as it's actually a shared responsibility." Check out the services, know your requirements, and make sure the provider is being honest and truthful, he says.

Top Tips

Know what's needed on your end. Even though you're handing over disaster recovery to a third party, you'll still need some in-house investments. "Anything you put in the cloud or service, you need to have another copy someplace else. Some providers will fail or go out of business. If data is that important, don't put it all in one location," says Greg Schulz, senior advisory analyst at Server and Storage IO. Joe Clabby, president of Clabby Analytics, says that you'll want a way to encrypt data sent over the network (look for cryptographic functions at the processor level or on crypto cards). Once you receive the data, you need to protect it via authentication and authorization.

Calculate your costs. Schulz says there's a "race to the bottom" going on now to see how low providers can cut costs. Be sure to understand upfront costs and additional fees. "I know of no reputable provider who's hiding fees. Are they on their main home page? No, but they are somewhere else—you have to look for them. If you understand what the fees are upfront, it could mean buying a more premium package to avoid some extra fees. Understand what your fees are going into it. Keep costs in mind but leverage them."

Explore The Argument For Flash-Based Storage

Consider These Use Cases For Reducing Costs & Enhancing Speed & Efficiency

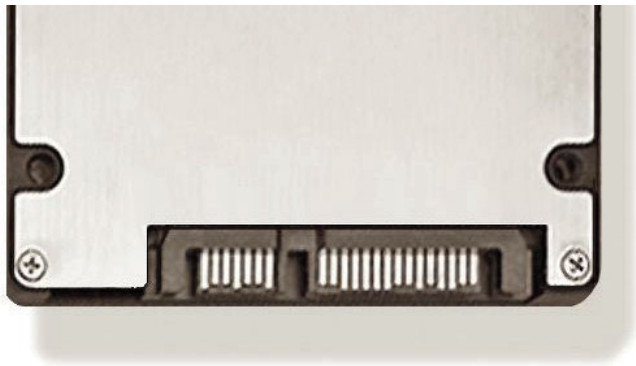
By now, IT and data center managers know the benefits flash-based storage can enable. Most also know it's not whether flash is in their company's future but rather when, where, and how much they'll deploy. Some enterprises have already adopted flash storage successfully, with enhanced performance and efficiency, power consumption reductions, and reliability gains among the results. The following details successful flash-based storage use cases, as well areas where deploying it may not be advisable yet.

Make A Difference

Server virtualization, virtual desktop infrastructure (VDI), and databases are among the more popular flash-based storage use cases to date. With server virtualization, flash may enable increasing the number of virtual machines (VMs) per server, resulting in fewer physical servers and smaller licensing fees.

Greg Schulz, senior advisory analyst at Server and StorageIO, says flash technology has matured to the point that price points, capacity, reliability, resiliency, durability, and business cases for using it have aligned. Whether related to growth, new applications, consolidation, or cloud/virtualization adoption, businesses have more to do now, he says. In terms of consolidation, for example, rather than utilizing 10, 20, or 100 disk drives to reach a level of performance, "I can do it with a couple of solid-state drives," Schulz says.

Although flash storage is appearing nearly everywhere, says Jim Handy, Objective Analysis director, penetration is happening slightly slower in applications with high-resiliency requirements "because many support solutions are still unavailable from dominant storage vendors." This includes replication and snapshots in some cases and extends to coherency management in shared storage systems, he says. Some startups, however, have produced software solutions to take advantage of this fact, he says.



Look To Build

David Hill, principal at Mesabi Group, says although flash will likely have an increased role in organizations' futures, unless they are facing a need that must be solved immediately, they should "look beyond a quick fix and put together a strategy that not only solves an immediate need but puts into place a foundation that can be built upon in the future." For example, ask if the flash solution can cost-effectively scale to meet growing storage demand, be applied to multiple applications, and deployed on a wide geographical basis.

Focus On Speed

Flash storage is becoming particularly prevalent where transaction-heavy use cases apply. Several hard drives performing at about 200 input/output operations per second (IOPS) per drive, for example, are needed to match an SSD performing at thousands of IOPS, says Henry Baltazar, Forrester Research senior analyst. This translates to high performance and reduced power and rack space consumption and maintenance costs "because flash can replace walls of hard drives," he says.

The most successful flash implementations are those that can immediately translate into bottom-line improvements (cost savings, increased revenue, etc.), Handy says. Online transaction processing (OLTP), for example, benefited early on from flash storage, enabling increased trading volumes for a small incremental cost, he says.

Arbitrage/stock trading, meanwhile, benefited from flash enabling an immediacy of transactions, leading to revenue improvements. Justifying flash storage implementations can be more difficult in other situations, Handy says. For example, knowing exactly how much power or cooling savings flash might help produce can be difficult, though "this is precisely what large data centers are doing today with flash," Handy says.

Deploy Wisely

A relatively small flash storage deployment initially can make sense for many companies. Baltazar recommends focusing on an obvious use case, such

as transaction-sensitive databases, virtualization, and VDI. After testing and verifying the deployment, it then makes sense to expand, he says.

Similarly, Handy says deployments commonly involve incrementally adding flash to solve a pressing problem. "This typically provides a huge, unanticipated advantage," he says. Some companies have replaced entire storage systems with one that integrates flash into a storage hierarchy, he says. Although this can be "pretty extreme," he says, "it only comes to those whose regular pattern is to replace their entire IT investment periodically, like every five years, in a budgeted way."

David Hill, principal at Mesabi Group, says the main driver for using flash storage is improving performance where an I/O bottleneck exists. Today, however, there are numerous deployment choices, including in-memory, PCI-E, all-flash array, or hybrid array options. In-memory and PCI-E are basically "flash storage as a cache" to speed up performance, he says. All-flash and hybrid array "represent flash storage as the production copy and a tier of storage (Tier 0)," he says.

The theory in a hybrid array is, in order to improve performance, only a small portion of storage (5 to 8%) must be flash and the Tier 1 high-performance HDDs must remain the same or be replaced with cost-effective HDDs, he says.

Take Caution

Currently, flash-based storage isn't an ideal fit for all situations. For example, flash is still too expensive for backup and archive storage, Baltazar says. This could change, but hard drives and tape are less expensive for now. Handy says some users have found flash incompatibilities with existing systems (RAID controllers, for example). Certain pre-SSD systems, he says, "have built-in issues that undermine the use of flash."

Generally, determining where flash will prove beneficial requires IT to pinpoint where problems or bottlenecks exist or where an opportunity to proactively enable optimization resides, Schulz says.

If you're unsure of where pain points are, Schulz advises using vendors' tools to locate them. He cautions that some vendors may only have one flash solution, thus they may say the best place to put flash storage is in the area their solution covers. "All they have is a hammer, so everything has to look like a nail," he says. "Others will walk you through, find the immediate pain, and take care of it." P

See The Business Benefit

Greg Schulz, senior advisory analyst at Server and StorageIO, cautions that if organizations are looking at flash "from a cost-per-capacity standpoint, you're using the wrong metric." Doing this is comparable to saying, "How much gas can your car hold?" vs. "How many miles per gallon can you go?" or "How quickly can you get from point A to B?" Schulz says. Overall, although capacity is an important factor when making storage considerations, he says, flash storage is more about seeking productivity gains and acquiring the ability to do business faster, he says.

BONUS TIPS:

Prepare For Variations

Forrester Research Senior Analyst Henry Baltazar says that although many flash array vendors make assumptions on the efficiency of deduplication ("4:1 reduction ratio seems the standard"), efficiency will vary based on the data being stored. "Databases typically don't deduplicate, while VMs seem to do well with dedupe," Baltazar says. When you're ready to deploy flash storage, he advises to "always test with data that is similar to production data to see what efficiency level is viable."

Make A Case

David Hill, principal at Mesabi Group, says even though the price disparity between flash storage and HDDs is a barrier to increased adoption of flash storage, there is a strong argument that's being made that flash storage can be competitive in terms of pricing in some cases, such as where deduplication and compression on flash storage can be used. Additionally, an argument is also being made by some that flash storage can guarantee better quality of service, Hill says.

Cost-Saving Ideas For Unified Communications

Avoid Setbacks That Can Negatively Impact Finances After Deployment

Enhanced speed and efficiency and less complexity are just a few reasons why enterprises embrace unified communications. Despite the positives of implementing a UC solution, some enterprises find doing so negatively impacts their finances in ways they didn't anticipate. But there are ways to save costs when implementing UC.

Prepare Well

To avoid setbacks that prevent enterprises from leveraging the benefits of implementing a UC solution, Rob Bamforth, Quocirca principal analyst, says you should identify working groups and pilot ideas for which clear benefits and potential champions are recognizable before deploying any technology. After a broader rollout, "foster a collaborative self-help mentality and community spirit," he says.

Some companies do this by conducting "unofficial" soft rollouts to limited teams, which can build curiosity and interest among teams not initially involved.

Tim Banting, principal analyst, collaboration and communications, at Current Analysis, says not having a well-thought-out implementation plan can result in costs escalating.

For example, nearly all UC solutions today run over a company data network, which must be up to scratch—this is the lowest common dominator for every vendor's solution, he says. Thus, there is budget for potential LAN upgrades, he says.

Barry Cousins, Info-Tech Research Group senior consulting analyst, says although UC offers compelling possibilities, "for most people, the dial tone is still critically important."

Ensure network capacity outpaces demands of real-time communications and develop communications-enabled business processes (CEBP) that "make the enhanced communications pay back in the form of tangible benefits, such as lower costs, faster throughput, or improved revenue," Cousins says.

For Jim Rapoza, Aberdeen Group senior research analyst, poor preparation is the biggest issue that derails UC implementations. Some organizations believe they can simply deploy UC and immediately reap benefits only to find their network can't handle real-time voice traffic, their cost-savings expectations were unrealistic, or end users are unhappy. Beyond prep work and testing, monitor and understand current networking and connectivity infrastructures, he says.

If network pipes are already maxed out, for example, expect to make upgrades. Rapoza says there are testing tools that help prep infrastructures to handle the real-time traffic and loads UC introduces.

Avoid Landmines

Assuming all users will adopt and take to UC technology is a common mistake that can impact costs, Banting says. Thus, run trials and audit users first. Additionally, don't assume all users need desk phones or soft clients or assume other absolutes. Bamforth cautions against deploying end-user technology without first assessing how your users actually work. For example, if they prefer their own devices, investigate if the UC solution can incorporate them.

Rapoza says few technology implementations will impact network performance the way UC does. Unlike email where some lag is OK, he says, "voice and video communication simply doesn't work with lag times and performance issues."

Users that encounter slow or inefficient performance will abandon the solution for alternatives, and your investment will be for nothing, he says.

Cousins says today's business climate puts a premium on a worker's willingness to be interrupted while discounting the value of sustained focus on their work. "An overreliance on UC leverages spontaneity and dilutes the need for people to plan their interactions."

Introduce Training

Tim Banting, principal analyst, collaboration and communications, at Current Analysis, says despite vendor claims that their solutions are easy to use, you need to ensure training is available to all employees.

Pick & Choose

Eliminating unnecessary UC features can save small to midsized enterprises (SMEs) money and reduce complexity. In fact, Rapoza says, businesses of any size can do without some features, as needs have more to do with communication requirements and culture. "For some, person-to-person video communication will be a must-have. Others will never use it but will leverage videoconferencing," he says.

Banting says SMEs' needs can actually be more demanding than larger enterprises. "SMEs might not know they need contact center functionality but would like a call queuing capability, social media integration, or a single PC-based client. SMEs also need a solution that's easy to administer and manage," he says. "They don't have a large IT team they can train up to support complex systems."

For enterprises with licensing bundles, Banting says, one costly error is assuming all users need all features and opting for premium user licensing packages.

Bamforth says needs will change over time as users become more confident and aware. Don't get locked in to a particular approach, technology, or set of end-user devices that prevents change. "The core of UC is unifying the communication around the individual and providing an infrastructure that flexibly delivers," he says.

Mull Your Options

For some companies, free collaboration tools and hosted/cloud-based UC solutions are a good fit cost-wise. Cousins says many smaller enterprises are adopting consumer-oriented communication/collaboration services as their UC offerings. Though they lose some value and control, they save on CAPEX and OPEX, he says. He advises conducting trials to identify needs such services can meet, as well as work practices that could shape decision-making and future investments.

Rapoza says the aforementioned UC solutions can be a very good fit for smaller businesses because they eliminate many infrastructure and deployment worries. This is particularly true of businesses already using a fast Internet pipe and that have a lot of home-based employees, he says. Free consumer-type tools can be a nice supplement to UC systems, he says, though they rarely can fully replace them. The key is ensuring the UC solution can integrate them.

Although free collaboration tools offer benefits, Banting says, they may lack security and compliance levels that other services provide. He also says "hosted or cloud-based services offer a per-user, monthly charge that's easy to budget for and offer secure, reliable services—some with financially backed SLAs." P

Check Everywhere

Aberdeen Group Senior Research Analyst Jim Rapoza says enterprises should investigate all options, including if systems and products already deployed contain collaboration and communications features found in UC solutions. He also suggests looking into third-party systems offered in hosted or as-a-service implementations.

BONUS TIPS:

Make A Case

Info-Tech Research Group Senior Consulting Analyst Barry Cousins says IT should develop a business case that leverages communications-enabled business processes (CEBPs), engage the right stakeholders with well-articulated roles, develop use cases that exhibit process-related benefits, formalize workflows that incorporate new UC features to simplify work, and implement needed infrastructure changes. Migrating infrequent phone users to softphones can reduce hardware, implementation, and relocation costs, he says.

Examine Your Options

Quocirca Principal Analyst Rob Bamforth says despite rapid technology advancements, some forms of communication that have been around a while are still a fit for employees of all ages. Often, he says, companies assume "Gen Y" employees are more flexible than older staff, but "they get set in their ways just the same, only the 'ways' are more recent." Overall, "the cornerstone of any approach has to be strategy. What is the key thing we are trying to achieve?" he says.

Make Sense Of Mobile Device Strategies

Smart Device Security & Control Strategies Are Maturing With The Growing Mobile Workforce

A NOTICEABLE SHIFT is taking place in the enterprise mobile market, which means there is no time like the present to refresh yourself, your IT leaders, and your workforce on the developing mobile device strategies making an impact.

This period of transition has been galvanized by Gartner's most recent annual mobility management Magic Quadrant report on the state of mobile device management (MDM) and enterprise mobility management (EMM). There's much to define and explore when you start discussing how the mobile industry will be shaped by these technologies, so consider the following as a primer on what you need to know as an IT decision-maker.

What's The Difference?

MDM is likely a familiar abbreviation because you may already be employing MDM software solutions to manage and secure mobile devices and tablets in your enterprise. You might also rely on mobile application management (MAM), which is a related technology that focuses on mobile application (and data) control as opposed to device-specific management.

Out of the amalgamation of MDM and MAM, EMM has emerged to encompass the evolving management of the mobile device, its applications, and its content, generally speaking.

According to Gartner, EMM suites will include some of the following functions: OS configuration management; mobile app deployment, updating, and removal; remote view and control for troubleshooting; mobile content management; and hardware and application inventory.

What Full Deployment Of EMM Could Look Like

Chris Marsh, principal analyst at 451 Research, says the way 451 Research looks at enterprise mobility management (EMM) is like a kind of embedded security infrastructure for mobile, "and then you'll get other parts of the application life cycle, which will become the other part of the mobile infrastructure" and include application platforms, life cycle management tools, and pre- and post-deployment. "EMM really needs to be that kind of infrastructural level of security so that everything else can scale," Marsh says.

Digging Deeper

What's becoming more clear as MDM and EMM develop over time is that the latter technology incorporates a broader range of functionality than the former.

Chris Marsh, principal analyst at 451 Research, says you can look at MDM as a way for IT to assert controls at the mobile device level, such as remote wiping, locking, and provisioning. Whereas EMM "is a bit more amorphous." He says it emerged about two to three years ago to address other types of controls that extend beyond the reach of traditional MDM.

"So if anything, EMM is a kind of marketing term, but it's been adopted sort of to loosely address and wrap up together MDM plus MAM plus things like content management, secure containers, that kind of thing. EMM is really a bit of a catchall," Marsh says.

To further explain the purpose of each mobile solution, Faisal Ghaus, vice president of TechNavio Research, says MDM is primarily a tool for preventing unauthorized device access.

"MDM helps in the distribution of applications within organizations. It allows administration departments in overseeing the mobile devices as the desktop computers and provides security in synchronizing of the information and sharing," Ghaus says. "EMM plays a higher role wherein it looks after device, application management, [and] a host of other features such as configuration management and application delivery and deployment."

Go Beyond The Device

Up until EMM came onto the mobile management scene, control was primarily driven by device adoption. However, Marsh says

that companies have started looking for alternative ways to control mobile beyond the device because applications are either being used more or "companies are mobilizing their processes and workflows into applications or rethinking those workflows and processes in a mobile-first sense, so device management doesn't really cut the mustard."

Marsh adds that this switchover to app-oriented control is taking some time because it's happening alongside and stimulating, in a sense, the maturity of mobile app strategy.

Ghaus says new app strategies will help an organization to work more securely and effectively on its devices, as well. "EMM would provide users with new tools and applications that would be specific for their task requirement. Application delivery would be a standard offering of EMM."

From The Inside Out

As EMM continues to make waves in the mobile management pool, companies will look for ways to enhance the user experience as employees better understand how EMM will automate workflows and change individual mobile functionality in general.

"As an employee, I could involve myself in a kind of EMM capability as opposed to having IT do it for me," Marsh says. "And the more you can compress all of that, then the easier it will be to scale quickly. You can potentially now roll out a big deployment of thousands of employees in a much shorter amount of time."

The takeaway from these possibilities is that EMM should be viewed not simply as a security enhancement, but rather as an innovative infrastructural change "because it extends both security and user controls," Marsh adds.

So if you begin planning which new layers of security you'll deploy on devices and the corporate apps you want to extend sooner rather than later, you can provide more of a road map for your users. P

EMM Doesn't Force MDM Out Of Relevancy

According to Chris Marsh, principal analyst at 451 Research, there are plenty of cases in which you may need to utilize the capabilities of mobile device management (MDM) to remotely wipe or lock a corporate-provisioned device for retail staff, field-force workers, or other employees regularly utilizing mobile devices. This means MDM technology still has its appropriate place and "it's not like EMM [enterprise mobility management] necessarily is negating the need for MDM, it just depends much more on the use case." Marsh says EMM essentially provides more options for IT "to do what they need to do in terms of security and user management."

BONUS TIPS:

How Do You Determine If You Need EMM?

What's up-and-coming in technology trends may not always be what you need at the moment, so when it comes to comparing the latest functions mobile device management (MDM) and enterprise mobility management (EMM) offer, Faisal Ghaus, vice president of TechNavio Research, says mobile management decision-making boils down to "the sort of work being done and type of data being stored on an enterprise mobile device." Essentially, an IT leader could determine whether MDM is enough or if the organization should consider rolling out EMM solutions according to current data storage requirements. "An IT decision-maker will need to take into stock as to what are the sort of applications and data which the personnel of an enterprise are working with in order to understand if EMM is required or just MDM," Ghaus says.

BYOD As It Relates To MDM & EMM

The bring-your-own-device (BYOD) trend is still growing in popularity, Ghaus says, but along with the increasing use of employee-owned mobile devices in the workplace comes the multiplication of vulnerabilities to potential data breaches because of improper mobile security. MDM and EMM act as a defense layer, but they do so differently. "MDM ensures that no unauthorized use of the devices can take place; however, EMM ensures that no unauthorized use of the applications themselves on the device can take place."

Re-examine The Case For Deploying DCIM

Determine If The Time Is Right To Embrace Data Center Infrastructure Management's Potential

Reportedly, 36% of those attending a Gartner Research-sponsored conference recently indicated they will probably implement DCIM tools this year in a "significant" way. Another 25% will reportedly do the same within two years. Gartner's researchers, meanwhile, predict 60% of larger North American data centers will embrace DCIM by 2017.

This type of enthusiasm for DCIM isn't new. DCIM has been generating a buzz for years because of its potential to help better manage all assets in a single-pane approach, reduce energy use and costs, and determine the best location to install equipment. So why have relatively few small to midsized enterprises (SMEs) formally committed to DCIM?

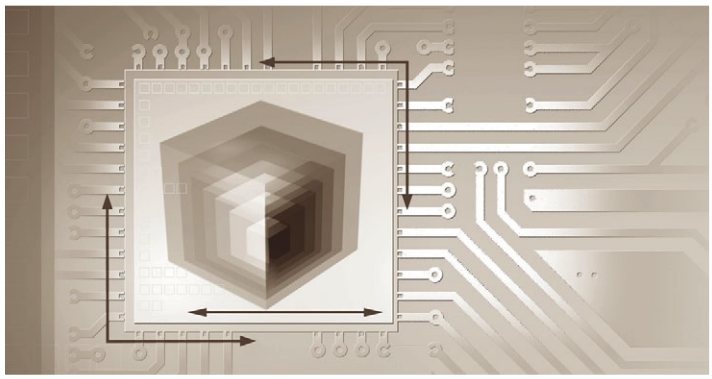
State Of Affairs

Adoption of DCIM tools among SMEs is expected to grow in the future. For now, however, adoption is viewed as being low.

Jennifer Koppy, IDC research manager, says that's mainly because the problems they're trying to solve with DCIM don't really align with the cost structures of many of the enterprise-class DCIM solutions. Some DCIM providers, however, are offering as-a-service solutions, and more are expected to do so this year, which will increase adoption rates, Koppy says.

Clive Longbottom, Quocirca co-founder and service director, agrees adoption rates are low but growing, and adds that enterprises that own their own data center facilities are slowly realizing they can't view the facility and IT equipment separately but rather as one dynamic entity.

Vendor-wise, Longbottom says rather than push true DCIM solutions, some vendors have created business infrastructure/information management (BIM) solutions with a "small bit of IT capability." Most vendors, though, have pushed hard to bridge the chasm between facilities management and IT systems management camps.



Overall, for anyone who owns a data center, Longbottom says, the need for a DCIM solution "is now clear and becoming clearer," even for organizations that share a facility (colocation)—a reality most SMEs are moving to in the near- to midterm, Longbottom says.

Making Sense Of DCIM

One natural question concerning DCIM is if the hype is justified. Yes and no, experts say. Roopashree Honnachari, Frost & Sullivan industry director, says the DCIM tools now available are good, but not enough vendor "handholding or consulting services" are available to help with implementation.

Koppy says DCIM's promise is obtainable if an organization can enact significant process changes and commit the larger enterprise to the project. Many IT teams have difficulty getting DCIM up and running, she says. DCIM providers that can provide consultation services will be the providers likely to "have happier customers who realize greater ROI," Koppy adds.

Benefits often attached to DCIM include the greater visibility tools provide into the entire IT landscape. Others

Key Points

- Adoption of DCIM tools among small to midsized enterprises is currently low but expected to increase in coming years.
- Expense, deployment difficulties, and lack of general DCIM knowledge are often-cited adoption roadblocks.
- A successful DCIM implementation can hinge on IT and facilities teams being closely aligned.

Get Started

Deploying DCIM can prove challenging if a siloed nature exists among teams managing different systems. What's needed is a unified team that combines IT, facilities, and operations expertise, says Roopashree Honnachari, industry director at Frost & Sullivan. A unified team will facilitate interaction among key stakeholders and help explain interdependencies and relationships among various components, which assists with designing, implementing, and managing "a solution better aligned with business goals," Honnachari says.

include quickly and effectively finding root causes of problems and resolving them; better asset and life cycle management of equipment; creating what-if scenarios for new IT equipment installations; and better energy management.

Koppy says IDC research shows SMEs typically seek out DCIM for operational benefits such as lower energy usage. Larger organizations typically desire more strategic benefits such as linking IT spending with business value.

Overall, DCIM tools automate monitoring of data center infrastructure components, both facilities and IT, Honnachari says, thus enabling better management of costs, achieving efficiencies, and ultimately analyzing data and making changes accordingly.

Reach Your Potential

Beyond being too expensive and difficult to deploy, SMEs report they haven't adopted DCIM yet because they're using other methods to manage data centers. They also lack knowledge concerning available DCIM tools. SMEs with this knowledge that haven't adopted DCIM state the main reason is a lack of "touch points" between facilities and IT, Longbottom says.

SMEs that do have a facilities-IT union may not adopt DCIM simply because of perceived complexities and costs, Longbottom says. Honnachari says deciding if DCIM tools should come out of IT or facilities' budget can also pose a hurdle to adoption.

Enterprises that do purchase DCIM tools may wind up underutilizing them by implementing and managing them in a siloed manner (facilities and IT), Honnachari says. IT, for example, can ramp up its server and storage environment anytime, but it still depends on facilities to ramp up facilities infrastructure (space, power, and cooling), she says. "Despite the high level of inter-dependency, IT and facilities teams continue to operate separately, which hampers the path to efficiency."

Organizations feeling pressured to provide better, faster, and more reliable IT services without additional budget have to better use what they already have, Koppy says. Doing so "can mean the difference between barely surviving or thriving in the next few years."

There are numerous ways to quantify DCIM's value, Koppy says, including varying ways based on how a company wants to proceed.

In some cases, though, "it's just not an option to continue to run a data center without visibility into how it all connects together," she says. "The regulatory requirements, audits, and security measures make this very painful and expensive, and this will only escalate in the coming years." P

Action Plan

Aim for quick wins. For example, if you're acquiring a DCIM solution, consider initially using asset-discovery and managements tools, mapping tools, and implementing life cycle management.

Use what-ifs. Using the "what-if" capabilities that DCIM solutions provide can enable IT to visualize how a certain scenario will likely play out, such as how installing a new rack in a specific location will impact cooling.

Obtain. Using DCIM tools can help obtain the optimal positioning for existing equipment in terms of power, cooling, and other factors.

Combine. Combine DCIM tools you acquire with existing management tools to optimize the entire enterprise environment on an ongoing basis.

Top Tips

Maximize every resource. To ensure that DCIM tools are used to their fullest, it helps greatly if IT and facilities teams are closely aligned. Reduced infrastructure costs, more operational efficiency, and alignment of IT with business goals are potential benefits of doing so.

Get both IT and facilities onboard. Having IT and facilities teams that aren't in close alignment can lead to DCIM tools getting used differently, depending on which team bought the solution.

Ask around. When eying DCIM vendors, ask their current customers questions pertaining to your concerns. Also ensure that the vendor possesses a good road map of where it sees DCIM going in the near and distant future.

Demystify The Concept Of Application Containerization

Improve Performance, Agility & Flexibility With Packaged Applications & Infrastructure

Companies are always looking for ways to make their applications and services faster and more flexible, which is where virtualization and the cloud come into play. But there's a newer technology called containerization that could make your applications so flexible they can run in almost any environment you can imagine without necessarily needing help from outside infrastructure.

What Is It?

Containerization, and the solutions supporting it, is essentially "an application packaging technology that includes not only the application but also the supporting infrastructure," says Jay Lyman, senior analyst at 451 Research.

Instead of installing an application on each individual desktop in an office, complete with its own operating system and other resources, for example, you can deploy it in a container with every resource it needs to run.

"It's a little bit more lightweight and flexible than a virtual machine, yet you can still do something that typically the industry has been using VMs for, which is packaging up an application and its dependencies and putting them in a virtual container that can run on various infrastructure," Lyman says.

This type of containerized deployment makes it possible to not only run your application in an environment that is tailored to its specific needs but to also run in it in a public, private, or hybrid cloud environment, a virtual environment, or on bare-metal servers in a traditional data center setting.

"Containerization is catching on because you need something more lightweight [than a VM] when you talk about moving all of these applications, services, and workloads between all these infrastructures," Lyman says. "It gets to be too cumbersome and there's too much overhead for a full VM. The essence of containerization is that it provides a place to isolate resources, like CPU, memory, I/O, and connectivity, and it doesn't require starting any VMs to do so."

Simplified Management

One of the main benefits of containerization or virtual containers is the ability to package applications in a more uniform way. Lyman compares them to shipping containers where "what's inside the container can be a variety of things, but the method and unit of packaging is consistently the same." This means that the packaged application and resources can be written in any language or built on any particular framework.

"It fits this trend toward blueprints and repositories, preconfigured and pre-certified pieces of software so you don't have to configure Apache Web servers every time you deploy the application," Lyman says. "It's a Legos metaphor where these things are all the same shape, fit together, and you can create what you want with them, and they'll be the same to manage and run across the different infrastructures."

Lyman admits that some benefits will only occur in best-case scenarios where everything is working just right, but the one benefit that always exists is for containerization to "serve as a standard amid a lack of standards in how you develop, deploy, and manage applications in both traditional data centers

Agile Businesses Force Large Enterprises To React

Although most large companies won't be able to take advantage of containerization right from the beginning, they will eventually be forced into it by competitors. Jay Lyman, senior analyst at 451 Research, says it's similar to taking a picture with your phone to deposit a check. When one bank started using the technology, every other competitor had to respond quickly.

"There are companies now that don't own any infrastructure and run completely on the cloud," Lyman says. "They put pressure on other companies to be faster, more agile, and more responsive. There's also shadow IT and one-off uses of technology within a company that let you bypass the IT department because they're deemed to be too slow. We're seeing organizations respond to that with cloud computing, DevOps, and self-service, and I think containerization has a significant role in all of those."

and cloud environments." Containerization forces you to preconfigure applications in a way that makes sense across the business, which means that management is essentially the same regardless of the deployment.

Increased Speed & Agility

Another benefit of containerization is improved agility. It's a way of overcoming the traditional "command-and-control" aspects of IT where it takes "three months to provide infrastructure for the developers and teams," Lyman says. Containers help you embrace the more modern way of doing things, which revolves around giving employees and consumers what they need when they need it.

Charlie Dai, principal consultant at Forrester Research, says that some containerization solutions use Linux containers, which makes them "much smaller than traditional virtual machine images" and means they will "boot much faster than VMs." With that increase in speed, IT can deliver applications much more quickly and meet the demands of users.

Containerization also helps speed up collaboration and response when it comes to fixing an application that isn't working correctly. It has built-in delineation, Lyman says, because if the issue "is outside of the containers, then it will fall on the operations folks," but if the issue "is inside the container, it's something for the developer to deal with." It makes it easier for the IT and development teams to delegate jobs and just generally benefit from internal teams working together more efficiently.

Who Is Using It?

Right now, Lyman says that companies on the "bleeding-edge"—technology and Web 2.0 startups, for example—are the ones adopting containerization, and that the technology is still in its early stages in terms of mainstream enterprise adoption.

Lyman expects to see the same pattern of adoption as there was with DevOps and agile IT in organizations. In those instances, adoption started with financial services, insurance, and telecom companies but eventually moved out to manufacturing, shipping, pharmaceuticals, life sciences, and defense and military organizations. Lyman says that containerization, although not something that needs to be implemented right now, is something that should definitely be on your radar for the future as it matures and goes more mainstream in the coming years. P

It's New But Will Continue To Evolve Over Time

Because containerization is relatively new, there are challenges to overcome. One such challenge, says Jay Lyman, senior analyst at 451 Research, is that it's mostly "Web and mobile applications being containerized and not typically more complex enterprise applications."

However, Lyman says there is a market developing around the technology and many vendors entering the space, which means at some point the technology should overcome those limitations and grow into more mainstream prominence. But as for right now, there are too many issues around "complexity and data and security concerns" with enterprise-grade applications, Lyman says, for them to fit into the current containerization model.

BONUS TIPS:

Get Help From A Third Party

Jay Lyman, senior analyst at 451 Research, says that the market developing around containerization will give companies "a lot of opportunities to get help" from third-party providers and learn more about the technology. "It's similar to the OpenStack cloud computing project. It's very compelling to users, but it's still very difficult to implement, so we advise them to seek some third-party help, and most of the success stories we hear about involve getting a vendor involved."

Make Sure It's A Fit

Containerization is not going to work for every company right away, so it's important to "evaluate your business requirements first" and take "vertical solutions and service quality" into consideration, says Charlie Dai, principal consultant at Forrester Research. "Container technology is not a silver bullet," he says, so "companies should take a hybrid strategy" and test proof-of-concept deployments to make sure the technology itself is a fit and that the application will perform correctly in all environments.

Buying Tips:

Colocation Services

So you've decided to look into data center colocation. The first step in selecting a provider is to determine what your true costs are so you can make an apples-to-apples comparison of services, says J. Bruce Daley, vice president and principal analyst at Constellation Research.

"This is usually a different process than budgeting, since the cost has to be calculated according to the vendor's or industries' pricing regime," he says. To ensure that you choose the most cost-effective colocation provider the first time around, read on for detailed advice.

Examine All The Options

Faisal Ghaus, vice president of TechNavio Research, says you can categorize colocation service vendors into three major segments: planning and consultation, facilities infrastructure provisioning, and maintenance and monitoring.

Vendors that offer planning and consultation options "provide enterprises with the required support for effective implementation and selection of colocation services," he says.

If you're looking for hardware infrastructure support, go with a colocation provider that provisions data center space; computing equipment installation and maintenance; and support services for both the enterprise and end users, Ghaus says.

Within the maintenance and monitoring segment, look for vendors that offer expertise in efficient facility management and optimization.

Choosing one of these three paths shouldn't pigeonhole you into receiving only those services because there are a number of vendors that provide one or more of these services for the enterprise, Ghaus says.

What's The Impact Of The Physical Location?

Because there is an increasing demand for continuous monitoring, the geographical location of the facility and its cooling capabilities should both be important factors in your decision-making process.

"Once you get past latency issues, the most important factor to consider is how cool is the climate the data center is located in and how close is it to renewable energy resources," Daley says. "This is one of the reasons I like data centers in Iceland."

Reputation Is Everything

Aside from assuring that you've selected a safe service provider location, you also want to get the lowdown on the provider's reputation. Ghaus says to take into account a service provider's years of experience and current clientele to avoid compromising and get what you need.

Know What You Can & Can't Do With SLAs

Service-level agreements were originally created to protect the vendor and not the customer, Daley says, so keep this in mind when you're discussing policy and annual service reviews.

"Apart from the standard services," Ghaus says, "the enterprise is advised to have a plan of all the services that will be procured from the colocation service providers over the lifetime of the service."

He adds that all of the enterprise requirements need to be included as a part of the SLA "and also provision has to be made to incorporate the required features in the future if necessary."

The key advice to remember is that if you're the customer, you have the opportunity to utilize some negotiating power. Be sure to look at all reference documents and define terms that seem contextually vague.

Consider "test calling" the service provider prior to meeting—during both normal support hours and after hours—and simulating an incident to evaluate the escalation process.

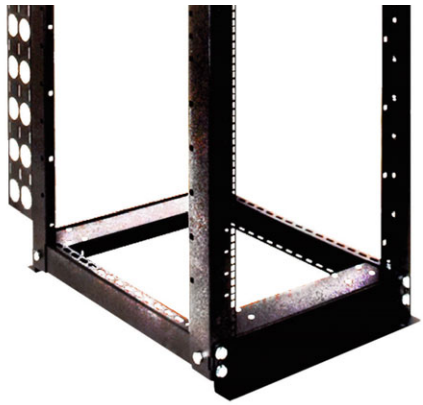
Checklist

Consider the following list of questions—based on suggestions from TechNavio Research Vice President Faisal Ghaus—when meeting with a potential colocation provider:

- Does the service provider value and regularly evaluate data security?
- What is the provider's reputation and experience?
- To what extent can the provider customize its services?
- Where is the facility located? Is it a safe place for long-term data storage?
- Do you feel comfortable about the pricing options?
- Does the vendor provide platform-independent solutions?

Buying Tips:

Data Center Racks & Cabinets



Racks and cabinets hold and protect every piece of equipment that runs your data center, so don't rush the decision about which cabinet to purchase. Instead, focus on the most important features and ensure the cabinet will fulfill your needs for years to come.

Know What You Have Already

As you begin researching what's on the market, it's important to inventory your current rack and cabinet infrastructure.

Andrea Jannsen of Data Center Systems Inc. (952/403-9900; www.datacsi.com) says to consider the space you're working with already and select the rack that allows the most depth. For instance, if a rack is too shallow, she says cable management can become an issue. "That leads to a more congested space in the rear of the rack and that can trap the heat from the servers and create bad airflow patterns and high temp alarms for the devices," Jannsen says.

Eli E. Hertz, CEO and president of Hergo (888/222-7270; www.hergo.com), says to look for potential add-on items, such as overhead storage compartments, power and cable management solutions, and back and side panels. Different sized racks and cabinets paired with additional solutions can help you design a product that's perfect for your data center.

Pinpoint Special Needs

Although standard racks and cabinets will serve most data center needs, Gina Dickson, director of global product management at Black Box (877/877-2269; www.blackbox.com), says there are four common scenarios where you'll want a specialty rack or cabinet: environmental conditions, noise, space considerations, and cooling.

Dickson says other cabinet types include wallmount versions designed to help save floor space or cost and sound-dampening cabinets for use in areas where people are present or working. You should also consider a rack or cabinet with built-in security measures, such as locked cages or other alternatives, if there is a lot of traffic in your data center.

Get The Right Fit

In most cases, you've decided which pieces of equipment to buy for your data center before you start shopping for the racks and cabinets to store them. It's a great opportunity to measure each piece and create a mock configuration for how it will fit into the rack or cabinet.

But be careful you don't populate the racks or cabinets with more equipment than you can reasonably concentrate in one area in your data center, says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com).

A higher density of equipment creates more heat and possible hot spots. "Make sure your cooling equipment can adequately cool the equipment before you put it all in one spot."

The amount of space the rack or cabinet takes up is equally important. Leave adequate space for future expansion. If you don't, you could get stuck with a cramped and inefficient data center with no room for evolution.

Check For Airflow

If you are utilizing raised floors and CRAC units, having vents or grills to allow airflow through the structure is essential, Koty says. "Look for server cabinets that provide good ventilation. Make sure that the cabinets draw cold air from the front and discharge in the back to enable a hot/cold-aisle configuration."

Jannsen adds that rack airflow needs to be taken into consideration, as well. It's critical to determine if all the devices are designed with the same airflow pattern because it affects both the side airflow and the design of the rack, especially if your equipment heat exhaustion is mixed.

Research The Vendor

The decision of whom to buy from is essential. "You need to make sure that the supplier you have chosen has been in business long enough to have an established reputation in the market," Hertz says.

Knowledge of the product is key. Hertz says you should be able to grill the supplier on what you are actually going to be getting, and the vendor should know the product from nuts to bolts. P

Checklist

Cable management. Is cable management built-in, or does the rack or cabinet leave adequate space to neatly route cables?

Mounting. Does the rack/cabinet provide PDU mounting options such as brackets?

Special requirements. Does the equipment you're mounting require tapped or M6 holes?

Check for fit. Will you need to disassemble the rack/cabinet to get it in the room?

Security. Can the cabinet be locked to prevent potential security issues?

Network With Your Peers At These IT Training & Association Meetings Across The United States

SEPTEMBER

DatacenterDynamics Converged Seattle
Sept. 4
Hyatt Regency Bellevue
Seattle, Wash.
www.datacenterdynamics.com
/conferences/2014/seattle-2014

AITP Wheeling
Sept. 10
White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.
www.aitp-wheeling.org

AITP Research Triangle Park
Sept. 11
NC State University Club
4200 Hillsborough St.
Raleigh, N.C.
www.rtp-aitp.org

AITP Washington D.C.
Sept. 11
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

SharePoint TechCon
Sept. 16-19
Boston, Mass.
www.sptechcon.com

ISSA-LA & OWASP-LA
Sept. 17, 6:15 p.m.
Microsoft Technology Center
13031 W Jefferson Blvd., Suite 200
Playa Vista, Calif.
www.issala.org/events

AITP Southwest Missouri techITout Technology Showcase Expo
Sept. 18
Oasis Convention Center
I-44 & Glenstone
Springfield, Mo.
www.techitoutexpo.com

AITP Twin City
Sept. 18, 7 p.m.
Ozark House Restaurant
704 McGregor St.
Bloomington, Ill.
www.aitp.org/members/group_content_
view.asp?group=75779&id=125369

Administering Windows Server 2012
Sept. 22
New Horizons Charlotte
9140 Arrowpoint Blvd., Suite 400
Charlotte, N.C.
www.nhcharlotte.com

High Performance Computing for Wall Street: Show & Conference
Sept. 22
Roosevelt Hotel
Madison Avenue & 45th St.
New York, N.Y.
www.flaggmgmt.com/hpc

Interop New York
Sept. 29-Oct. 3
New York, N.Y.
www.interop.com/newyork

AITP Akron
Sept. 30
Akron, Ohio
www.akron-aitp.org

OCTOBER

DatacenterDynamics Converged Chicago
Oct. 1
Hyatt Regency McCormick Place
Chicago, Ill.
www.datacenterdynamics.com
/conferences/2014/chicago-2014

AITP Wheeling
Oct. 8
White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.
www.aitp-wheeling.org

AITP Research Triangle Park
Oct. 9
NC State University Club
4200 Hillsborough St.
Raleigh, N.C.
www.rtp-aitp.org

AITP Washington D.C.
Oct. 9
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

AITP Southwest Missouri
Oct. 15
MSU e-Factory
405 N. Jefferson
Springfield, Mo.
www.aitpspringfield.org

ISSA-Los Angeles
Oct. 15, 11:30 a.m.
Taix French Country Cuisine
1911 West Sunset Blvd.
Los Angeles, Calif.
www.issala.org/events

AITP Twin City
Oct. 16, 7 p.m.
Ozark House Restaurant
704 McGregor St.
Bloomington, Ill.
www.aitp.org/members
/group_content_view
.asp?group=75779&id=125369

Data Center World—Leadership Conference
Oct. 19-22
Orlando World Center Marriott
Orlando, Fla.
www.datacenterworld.com/fall

DatacenterDynamics Converged Phoenix
Oct. 21
Hyatt Regency Phoenix
Phoenix, Ariz.
www.datacenterdynamics.com
/conferences/2014/phoenix-2014

Big Data TechCon
Oct. 27-29
Hyatt Regency
1333 Bayshore Highway
Burlingame, Calif.
www.bigdatatechcon.com

AITP Akron
Oct. 28
Akron, Ohio
www.akron-aitp.org

NOVEMBER

DatacenterDynamics Converged Toronto
Nov. 6
Eaton Chelsea
Toronto, Ontario
www.datacenterdynamics.com
/conferences/2014/toronto-2014

Do you have an event you'd like to see listed?
Send an email to feedback@processor.com.

HAVE YOU BEEN TO www.PROCESSOR.com LATELY?

We've redesigned the site to make it easier to find the product news and technology information you trust!

A drill-down search to view content by specific product category

Easy access to read full articles

Article Listings provide brief overviews of the latest content added to the site

PROCESSOR Solutions Directory

Here are brief snapshots of several companies offering products designed for the data center and IT industry. Listings are sorted by category, making it easy for you to find and compare companies offering the products and services you need.

You can find more detailed information on these companies and the products they offer inside this issue.

To list your company and products, call (800) 247-4880.

Physical Infrastructure

DATA CENTER SYSTEMS, INC.
Providing Solutions to Critical Problems

Data Center Systems, Inc. has been the exclusive Liebert representative in Minnesota, North Dakota, South Dakota, and Western Wisconsin since 1978. We are committed to providing business owners, contractors, value added resellers, consultants, engineers, and IT departments with HVAC and critical support solutions.

Products Sold:

- Presicion Cooling
- UPS Systems
- Server Racks & Cabinets
- Power Distribution & Conditioning
- System Monitoring
- Load Bank Rentals
- Smart Solutions
- Surge Protection
- Fire Protection Solutions
- Monitoring
- Portable Cooling

(952) 403-9900 | www.datacsi.com

Physical Infrastructure

AUSTIN HUGHES

Founded in 1995, Austin Hughes Electronics Ltd. is a design and manufacturing group that offers a broad range of solutions based around 19-inch rackmount technology. With a wealth of experience, Austin Hughes design and development teams are focused to rapidly transform customer requirements and market trends into saleable solutions.

Products Sold:

- Infra solution Cabinet Smartcard Handles
- InfraPower Cabinet Intelligent PDUs
- CyberView Rackmount KVM & LCD Console Drawer
- Environmental Sensors

(510) 794-2888 | www.Austin-Hughes.com

Physical Infrastructure

TOTAL CABLE SOLUTIONS

Total Cable Solutions (TCS) provides a wide range of products from copper keystone jacks to custom bundled fiber cables. All products are manufactured with TCS' highest quality, in factories that are ISO-9001 and TUV Certified. All of our cable lines meet or exceed EIA/TIA RoHs standards.

Products Sold:

- Fiber patch cords
- Pre-terminated multi-fiber trunk cables
- CAT5e and CAT6 patch cables
- Fiber and copper patch panels

(888) 235-2097 | www.TotalCableSolutions.com

Physical Infrastructure

Fike®

Fike is a globally recognized supplier of products and services that protect people and critical assets from dangers such as fire, explosion and overpressurization. With nearly 70 years experience manufacturing products ranging from rupture discs and explosion protection systems, to fire suppression and fire alarm systems, Fike offers reliable solutions for customers around the world. Fike's goal today is the same as it was in 1945—deliver exceptionally reliable safety products that exceed customer expectations.

Products Sold:

- Fire Suppression
- Detection and Control
- Fire Alarm
- Explosion Protection
- Pressure Relief
- Oil & Gas

(816) 229-3405 | www.fike.com

Physical Infrastructure

Atlas Sales & Rentals, Inc.
THE PORTABLE COOLING & HEATING SPECIALISTS

Atlas has specialized in portable air conditioning since 1979 and leads the industry in server room and data center portable cooling. We offer "24/7" response from company-owned, full-service offices around the country, each stocked with a wide inventory of equipment for primary, supplemental, or emergency cooling. All portable items are available for sale or rental. Atlas is a Preferred MovinCool® Distributor and a GSA Certified MAS Contractor.

Products Sold:

- 1-5 ton portable air conditioners, air and water-cooled
- 12-ton portable coolers designed to roll through a standard doorway
- Ceiling-mount air conditioners – full line of MovinCool® packaged a/c units

(800) 972-6600 | www.AtlasSales.com

Physical Infrastructure

SIMPLEX™ ISOLATION SYSTEMS

Since 1979, Simplex Isolation Systems has been setting new design standards in modular expandable cleanroom components, isolation curtains, hardware, and new product development. Fontana, Calif.,-based Simplex's unique strip doors and mounting systems are designed for quick installation. Simplex parts and materials perform with optimum efficiency, last longer, and save you money. And with Simplex, you are always backed by industry expertise, product knowledge, and the best warranties in the market.

Products Sold:

- Cleanrooms
- Enclosures
- Strip doors
- Curtains

(877) 746-7540 | www.simplexisolationsystems.com

Physical Infrastructure

AVTECH™

AVTECH, founded in 1988, manufactures hardware and software for users at all skill levels to easily monitor environmental conditions in IT and other facilities. Their **Room *Alert*®** products will monitor, alert, log, graph, view, respond, report, and protect. Over 130,000 customers across 179 countries makes AVTECH a proven market leader, allowing 'Disaster Prevention' instead of 'Disaster Recovery'. Protect your facility today with AVTECH's **Room *Alert*®**.

Products Sold:

A full range of **Room *Alert*®** monitors, sensors, and software for temperature, humidity, heat index, power, flood/water, smoke/fire, air flow, room entry, outdoor and fluid temperature, fuel and water tank levels, panic buttons, oil, sound, light, and more. Alert by text, email, SMS, phone, and more.

(888) 220-6700 | www.AVTECH.com

Physical Infrastructure

LINDY®
CONNECTION PERFECTION

LINDY USA specializes in cables, adapters, electronics, and accessories for computer, networking, and audio video applications. Since 1932, Lindy has supplied high-quality interconnects to customers in commercial, telecom, and residential markets. What sets us apart is our complete dedication to innovation, performance, and reliability. Our cabling products are truly outstanding.

Products Sold:

- Networking Products
- Sharing, Converting, Extending
- Hardware and Security
- Cables
- Audio / Video
- USB and FireWire
- Add-On Cards
- Adapters
- KVM
- Input Devices
- Power
- Much more!

(888) 865-4639 | www.lindy-usa.com

Physical Infrastructure

SENSAPHONE®
REMOTE MONITORING SOLUTIONS

Sensaphone has been designing and manufacturing remote monitoring systems for more than 25 years and has more than 300,000 of its products in use. Sensaphone's product lineup offers a full range of devices with a broad number of features and applications designed to monitor your entire infrastructure and alert you to changes. All product engineering functions, including hardware and software design and circuit board layout and assembly, are performed at the Sensaphone facility in Aston, Pa.

Products Sold:

Remote monitoring solutions that provide email and voice alarm notification for problems related to temperature, humidity, water detection, power failure, and more.

(877) 373-2700 | www.sensaphone.com

Physical Infrastructure

BayTech®

BayTech was founded in 1976 and, since the 1990s, has developed unique products for remote power management. The company uses printed circuit board instead of wires for a better, more resilient connection between the data center equipment and the receptacle. BayTech provides an extensive Web site with brochure downloads, warranty information, and reseller support and also offers evaluation units for data centers.

Products Sold:

- Power control, distribution, management, and metering
- Power transfer switches
- Console management and remote site management

(800) 523-2702 | www.baytech.net

Physical Infrastructure

C&C POWER
ENGINEERED POWER PRODUCTS

While promoting creativity, innovation and good manufacturing practices, C&C Power has become an industry leader in the manufacture and servicing of battery systems, UPS peripherals, telecommunications equipment and electrical equipment. Our state-of-the-art facility features 170,000 sq. ft. of manufacturing space, including high power testing capabilities. We stock millions of dollars in inventory including bypasses, battery cabinets, telecom equipment and batteries to support customer requirements globally.

Products Sold:

- Battery Cabinets
- Battery Monitoring
- Made to order Cable Kits
- Power Distribution Panels
- Batteries
- Battery Disconnects
- AC/DC Power Systems
- Much more!

(630) 617-9022 | www.ccpower.com

Physical Infrastructure

COMPU-AIRE INC.
Specialized Environmental Air Conditioning Systems

Compu-Aire Inc. has been providing quality specialty air conditioning equipment since 1980. We offer products employing the latest state-of-the-art control and energy management technology and work with you to design HVAC systems that can save you money. Our engineered flexibility allows you to fine-tune your HVAC system to meet the specific requirements of your application, resulting in lower installed and operating costs, high energy efficiency, quiet operation, superior indoor air quality, and low-cost maintenance and service.

Products Sold:

Ceiling mount, floor mount, wall hung, console, and in-row air conditioning systems.

(562) 945-8971 | www.compu-aire.com

Physical Infrastructure

PDU Cables™
Innovator in data center efficiency

PDU Cables is the leading supplier of power distribution cables assemblies to data centers in North America. PDU Cables has been serving this industry since 1981 and is the first independent cable assembly company to introduce colored conduit into the power distribution cable market, the first to get UL 478 listing, and the first to introduce the Power Cable and Equipment Configurator software tool. The company is centrally located in Minneapolis, Minn., allowing it to offer 24-hour turnaround and shipping time of just one or two days to almost any United States destination.

Products Sold:

A range of power cables, cable seals, and power cord assemblies.

(866) 631-4238 | www.pducables.com

Physical Infrastructure

spot coolers
Portable Air Conditioning with Confidence

Since 1985, Spot Coolers has specialized in portable cooling and heating units for use in data centers, commercial office buildings, hospitals, schools, factories, and warehouses. As a United Technologies Company, Spot Coolers takes responsibility for ethics, safety, security and protecting the environment. With more than 5,000 portable cooling and heating units at our 38 locations nationwide, you can be sure that our delivery and installation staff are reliable and dependable: people you can trust!

Rentals & Sales of:

Air and water cooled air conditioning units, trailer-mounted cooling units, heat pumps, ceiling-mounted cooling units

(800) 367-8675 | www.spot-coolers.com

Physical Infrastructure

AMERICOOL
AIR CONDITIONING

AmeriCool, Inc. is the official sales, marketing, and distribution company for Weltem Air Conditioning products in North America. Our AmeriCool portable air conditioners are built to the highest standards in the industry and offer unbeatable performance, reliability, and value. With products ranging from 1 to 5 tons, we offer air-conditioning solutions to companies small and large. Due to the wide operating range of our product, 24/7 cooling capability, and rugged design, our product is a great solution for mission-critical needs and harsh industrial applications.

Products Sold:

- Portable Air Conditioning Units

(800) 680-0725 | www.americoolinc.com

Physical Infrastructure

COMPUTERWISE.

ComputerWise, a privately held U.S. based corporation founded in 1971 as a provider of off-the-shelf as well as custom software and systems for the manufacturing marketplace, has since 1981 manufactured factory data collection systems and equipment. Our product line consists of compact keyboard/display units, networking hubs (TIM1B) and concentrators (TLD2), plus application software.

Today ComputerWise manufactures a wide-range of data collection terminals, both stationary and portable, as well as Ethernet based terminals and our EC305 Ethernet Time Clock and EC305-FP Biometric Time Clock.

Products Sold:

- Data Center Wall Clocks

(800) 255-3739 | www.sales@computerwise.com

Physical Infrastructure

Server Technology
Quality Rack Power Solutions

Server Technology is committed to the PDU market with the largest group of engineers dedicated to power distribution and other solutions within the equipment cabinet. Advancements in device power monitoring help data centers monitor and improve their efficiency, and continuous research and development is fueled by companies that look to Server Technology for their custom cabinet power solutions.

Products Sold:

A complete line of cabinet PDUs, including Per Outlet Power Sensing (POPS), Rack Mount Fail-Safe Transfer Switch, Console Port access with remote power management, Switched, Smart, Metered, Basic, and -48 VDC

(800) 835-1515 | www.servertech.com

Physical Infrastructure

Based in New York City, Hergo Ergonomic Support Systems is an independent designer and manufacturer of enclosure cabinet solutions, technical computer furniture, and modular racking systems. The company's products are designed to promote organization in the workspace and to increase the productivity of computers, peripherals, and communications equipment. Hergo is known for its high-quality products and superior customer service.

Products Sold:

- Racks
- Enclosures/cabinets
- Motorized workstations
- Flat-panel arms
- Computer desks
- Cable management
- Power management

(888) 222-7270 | www.hergo.com

Physical Infrastructure

As an integrator and master distributor providing quality power solutions, HM Cragg has built a reputation as the company that delivers innovation to aid and satisfy its customers. HM Cragg was founded in 1968 and is 100% employee-owned, focusing on quality people and exceptional products.

Products Sold:

- AC and DC power solutions (UPSes, power distribution)
- Control and monitoring (environmental and power)
- Connectors and cables (cord sets, ePDU cables)
- Cooling and Racks (airflow management, portable cooling)

(800) 672-7244 I www.hmcragg.com

Storage

Boasting more than 20 years of experience in the industrial computing market, iStarUSA Group has made its mark in the design and manufacture of rackmount chassis, industrial power supplies, data storage, enclosed cabinets and racks, and custom power solutions. The group reaches a number of vertical markets via its four divisions: Claytek, iStarUSA, RaidAge, and Xeal.

Products Sold:

- Claytek: Racks and enclosures
- iStarUSA: Industrial chassis
- RaidAge: Data storage
- Xeal: Industrial power

(888) 989-1189 I www.istarusa.com

Messaging & Telephony

3CX was founded in 2005 by entrepreneur Nick Galea who saw the need for an open standard software PBX for Microsoft Windows. With 86.7% of businesses using Windows as their operating system, the need for a software-based phone system which runs on Microsoft Windows was evident. 3CX maintains a global presence with offices around the world, including the United States, the UK, Germany, France, Japan, and Cyprus, as well as fully localized websites available in more than eight languages. 3CX has been selected by leading companies and organizations worldwide to meet their unified communications and telephony requirements, including Boeing, Pepsi, Harley Davidson, Hugo Boss, American Express, and Toshiba.

Products Sold:

- Full range of VoIP telephony software products

(404) 465-3660 I www.3CX.com

Servers

Chenbro is a leader in enclosure solutions, selling its products primarily to system integrators and OEM and channel partners. The company's extensive research and development efforts help it to keep its competitive edge and maintain market leadership, with special focus on thermal, EMI, and acoustic solutions. Taiwan-based Chenbro has offices in the United States, UK, The Netherlands, and China.

Products Sold:

- A comprehensive line of PC chassis, server/workstation chassis, rackmount chassis, and HDD enclosures.

(909) 937-0100 I www.chenbro.com

Servers

Supermicro® (NASDAQ: SMCI), the leading innovator in high-performance, high-efficiency server technology, is a premier provider of advanced server Building Block Solutions® for enterprise IT, data center, cloud computing, HPC, and embedded systems worldwide. Supermicro is committed to protecting the environment through its "We Keep IT Green®" initiative by providing customers with the most energy-efficient, environmentally-friendly solutions available on the market.

Products Sold:

- Servers
- Motherboards
- Chassis
- Network switches
- Storage solutions
- Blade servers
- GPU servers
- Embedded

(408) 503-8000 I www.supermicro.com

Services

FIRSTTECH™

FirstTech was founded in 1979, as the pioneer of data center cleaning we have established the industry standard for cleaning procedures, equipment specifications and preventative maintenance programs. Choosing a well established and knowledgeable company like FirstTech for all your data center needs is certainly a best business practice.

Products Sold:

When it comes to your access floor we have you covered. From floor panels both new and used to floor panel lifting tools, support pedestals, high volume air flow panels, and static pressure correction systems. FirstTech is also one of the leading experts in data center leak detection and leak containment systems.

(800) 743-6001 | www.firsttechcorp.com

NOW *PROCESSOR* CAN
GO ANYWHERE YOUR iPAD GOES!

PROCESSOR.COM

PROCESSOR®

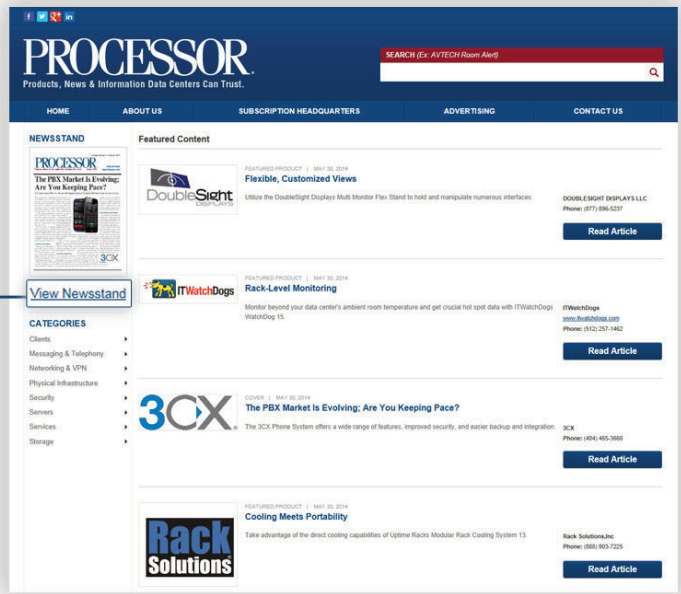
THE INSTANT ACCESS YOU NEED.
www.PROCESSOR.com

SIGN UP TO RECEIVE THE DIGITAL EDITION . . .
IT'S FREE

STEP 1. Go to
www.Processor.com
STEP 2. Click on Newsstand

View Newsstand

STEP 3. Click Subscribe Now!



PROCESSOR®

CHENBRO
www.chenbro.com
Your Mass Media Vessel
High Density Storage Server Chassis
NR40700
4U 48-bay Top-access Storage Server Chassis
RM43260
4U 60-bay Top-access JBOD
• Dual Domain SAS Controllers
• Green
RM14500
1U 12-bay Storage Chassis with HDD Easy-swap Installation
ODM/JDM Service
CHENBRO MICOM (USA) INC.
Add: 2800 E. Jurupa St., Ontario, CA91761, USA
Tel: +1-909-937-0100 Fax:+1-909-937-2100
Toll Free: 1-866-364-8264
E-mail: usinfo@chenbro.com
ASI
AVNET
INGRAM MICRO Components
MA★LABS
SYNNEX CORPORATION